

# Propy Whitepaper 2.0

Real estate NFTs, Defi,  
& Crypto Title Insurance Fund

The Commoditization  
of Real Property



2021

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In the following, we present a framework for the “trustless” frequent trade of ownership rights to real property, via the “encapsulation” of those rights into a Non-Fungible Token (NFT), and participation of NFTs in the DeFi space as well as crypto title insurance. In this framework, the transfer of possession of the NFT will act as a proxy for the purchase of the real estate.

The concept comprises maintaining an electronic version of the Propy NFT ownership proprietary paperwork “on-chain” where the NFT smart contract can change the name of the legal entity owner as a result of a transfer of the NFT from a seller to a buyer on an NFT auction site such as Propy NFT Marketplace. Our task is to provide the legal framework that authorizes the NFT smart contract to do the modifications of the legal paperwork, and also the legal framework in the Terms of Use agreements governing the creation and the listing of the NFT.

The paper will also discuss three ways of transacting real estate utilizing blockchain-enabled solutions, including NFTs; as well as “blockchainizing” or “NFT-ing” real estate in the US as a long term strategy.

# Introduction

Why are real estate NFTs the next logical step after digital collectible NFTs? The answer is simple: unlike movable personal property, real estate does not require a physical transfer of the property as it is immovable and cannot be stolen.

In the future, an increasing number of real estate transactions will be taking place remotely online. Besides coronavirus and other publicly disturbing events that lead to mass hysteria, there are behavioral and technological evolutions that have been turning real estate from a purely physical asset to a digitally behaving one.

The world of digital assets is expanding, and we are starting to see each piece of daily life being converted into a computer-readable format. Art and new digital commodities are being created in the metaverse in the form of NFTs. Money is already digital; in fact, only 8% of the world's currency is materialized in the form of physical cash. The stock market is digital, as Charles Schwab was the first major financial services firm to sell stocks online, which ultimately led to an online real-time market for digital assets. As for tangible physical goods of generally low value, such as books and clothes, the majority of these items are traded online and around the clock, thanks to e-commerce platforms such as Amazon, eBay, and Alibaba. In contrast to low-value goods and services, there is a class of high-value assets that are behaving more and more digitally due to their digital ownership representations; this category includes real estate, cars, expensive collectibles, boats, and venture investments.

When it comes to homes or cars, a digital record determines the ability of an individual to resell the asset in the future. It does not matter who actually uses the possession (i.e., lives in the house or drives the car); the legal owner of the high-value asset is the one who is recorded in a piece of code. Today, in the specific context of ownership, authorities store records in digital format (rarely on paper). In the United States, counties keep digital documents (scanned deeds) in databases that are managed by recorders' offices. The previously government-controlled process of establishing car ownership is now controlled by private companies that take care of the records. Thanks to an

increased trust in deals, not only has the process of online ownership transfer become possible, but the dependence on governments to store this data has decreased, unlocking further innovations. The real estate asset is behaving like a digital asset because the ownership of the asset is already digitized; furthermore, the paperwork for the ownership transfer is also mostly digitized (thanks to the innovations of companies and organizations such as DocuSign and the National Association of REALTORS). In addition to these significant changes related to real estate and how it is traded, there will be further transformations and developments in the coming decade.

NFT-ing a property means that ownership can be transferred from a wallet to another wallet in a secure manner, as a result of a fair auction on smart contracts. Paperwork, disclosures and title insurance are linked to the NFT.

If a movement of NFT-ing homes at scale starts in the US, those who will be doing the first NFTs for properties, might be entitled to receive royalty fees from all future secondary sales (agents and sellers).

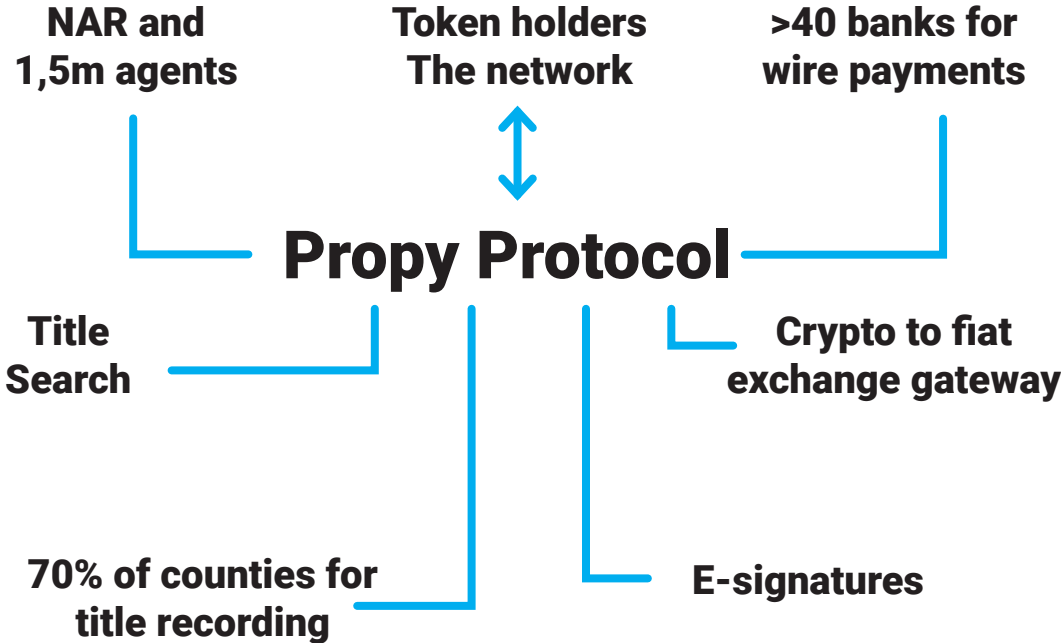
Depending on the kind of asset (land, housing, commercial properties), there may be a need for a management company that will take care of maintenance, payments, and collection of rents after the transaction. Still, these are services related to operating the property as a revenue-generating investment and do not relate in any way to protecting ownership rights. The notion of “custody” as it applies to real estate is closer to abstract functions involving legal operations and transfers of funds than to the physical handling and warehousing required by movable personal property or commodities. Thus there is a similarity to the digital collectible NFTs which have become popular in 2021.

This paper will explore how the process works, which middlemen will be eliminated, and which data providers should be accessed for the settlement.

# Three Ways to Transact Real Estate on Propy

Propy’s mission is to automate the real estate transaction process. Propy-developed infrastructure allows for three types of transactions that are demanded today. In order to achieve settlement for a property transfer, the system of smart contracts needs to receive data about the entire transaction, such as the title history, the payment and e-signed paperwork. It also needs to communicate to the current infrastructure - recording offices and banks for fiat payments. This is why Propy has been working on the critical integrations to make this data flow in and out and power the settlement.

Here’re the key data points Propy was able to connect to via numerous partners and integrations:



## **Traditional deals on smart contracts**

These transactions use fiat payments and mortgages, and are listed on Propy and Multiple Listing Services

## **Crypto payment**

Bitcoin, Ether, XRP and other cryptocurrencies can be accepted as methods of payment when properties are listed on Propy. Propy manages KYC, exchange and escrow. Properties may also be listed on MLSs.

## **NFT-ing a real estate asset**

While properties can be listed on an MLS and on Propy, NFT auctions can only be transacted on NFT marketplaces and are currently cash-only deals. Purchasers preferring traditional deals may request the NFT be “burned,” and then execute a traditional closing on Propy.

Sales channels and the closing process are not limited by any of the three options. Furthermore, all three options do not affect the payment of property taxes that are applied in any case.

Thus all these options do not have limitations in terms of the sales channels or the closing process. Property taxes are paid in all three options.

The market will initially have all three options and gradually one of the options will dominate. While Propy is currently doing all three, we expect NFTing real estate will eventually become the standard.

The underlying technology for all three methods of transactions is the Propy Protocol, which is described in the Whitepaper 1.0 of 2017. The Propy protocol relies on the Propy Registry which records each settlement on the blockchain via smart contracts. Every time a smart contract is executed there is a Propy token sent to unlock the settlement. Whether it is an NFT sale or traditional deal on the Propy platform, each transaction requires tokens to be executed.

## **NFT-ing real estate is possible in the following ways:**

NFT-ing an entire property.

Sharding an NFT to sell fractions of a property.

NFT-ing 20% of a property.

NFT of an entire property is the first use case developed by Propy. See below how it works.



# NFT-ing a Real Estate Asset

Propy suggests a novel model of keeping ownership rights via legal entities instead of personal names recorded in the county's recorders' offices or land registries, for the reasons government registries are not immutable, are prone to cyber-attacks and risk corruption.

Just like equity rights are being changed via the privately owned solution Carta, we suggest keeping home ownership rights via legal entities independent from governments by complying with regulations. Initially, county recorders or land registries will have the legal entity recorded as the owner, not an individual's name. When a property is sold, it is the legal entity that is sold and thus the ownership change does not require the recording by a governmental registry.

Propy is the trusted party that will provide the service to verify legal entities and provide maintenance services for legal entities. We envision many homeowners will prefer to keep their property rights in the entities to access a more liquid and secure market as well as due to privacy concerns because the majority of the US counties' records are public.

Propy has developed proprietary legal paperwork to encapsulate property rights into a US-based legislation entity.

For the POC US-based legislation is being used. Each sale of an NFT will effect a complete, self-contained transfer of membership rights because the legislation we chose does not require registration of the change of ownership of the legal entity but merely that the change of ownership gets recorded in the legal entity's private documents, kept internally by the entity owners.

Therefore we can maintain an electronic version of the Propy NFT ownership document on-chain (in the sense that an off-chain stored agreement is associated with an on-chain hash to ensure its authenticity), where the NFT smart contract can change the name of the legal entity owner as a result of a transfer of the NFT from a seller to a buyer of the NFT on an NFT marketplace. For the POC the ownership change will happen automatically and instantly when an auction is concluded and the buyer wishes to enter ownership. After the buyer provides the name and KYC information via an online form provided to the NFT buyer together with the digital assets, the NFT ownership transfers instantly to the buyer's wallet. The flow is described below in the chapter NFT Protocol and Flow for the Ownership Rights Transfer.

# Why Would Someone NFT Their Property?

## Royalty fees and innovation

Homeowners and real estate agents who are NFT-ing real estate, can learn how it works and can be part of history. Also, whoever NFTs a property first can be entitled to receive royalty fees from secondary sales.

## Crypto adoption and easiness of a transaction

The interest in real estate from the crypto community will be driven by the common desire to transact easily on-chain using cryptocurrency. A crypto holder most likely will invest a small percentage of their returns into any tangible real world asset if the process is crypto-friendly and simple. This is exactly what the NFT-enabled sale process offers.

## Collectible real estate

The initial use cases might be driven towards assets most relatable to collectibles before mass adoption of NFTs in the real estate industry more broadly. Trophy real estate is incredibly high in demand, but also short in supply. Its risk/return ratio is more optimized than other real estate assets. Typically located in super-prime or prime locations, these assets are generally a status symbol with well-known name recognition, a landmark, or an iconic building located at a prestigious prime address with strong underlying property fundamentals such as unique and distinctive design architecture, the finest construction, or the highest quality finishes available on the market.

Trophy real estate owned by celebrities, or in prime location, or with unique digital art and architecture can be regarded as a collectible. The level of pride of ownership is very high, and the purchased price is almost irrespective of the trading potential of the property, just like with other collectibles.

# NFT Legal Framework and Flow for the Ownership Rights Transfer

Propy has developed proprietary legal paperwork to encapsulate property rights into a US-based legislation entity.

Therefore we maintain an electronic version of the Propy NFT ownership document on-chain (in the sense that an off-chain stored agreement is associated with an on-chain hash to ensure its authenticity), where the NFT smart contract can change the name of the legal entity owner as a result of a transfer of the NFT from a seller to a buyer of the NFT on an NFT auction site such as OpenSea. For the POC the ownership change will happen automatically when an auction is concluded and the buyer wishes to enter ownership, which happens automatically after the buyer provides the name and KYC information via a form provided to the NFT buyer together with the digital assets.

## **One paradigm for a procedure to create a property NFT (the property held by a legal entity) is summarized below:**

1. The Propy NFT ownership document will contain a clause permitting the assignment of rights to happen the moment a sale of the NFT is completed as follows:
  - The clause shall stipulate that at any time the valid owner is the current owner of the NFT whose public wallet key will be stored in the NFT as "owner ID" AND whose name has been registered in the Company.
  - There will also be a legal clause stipulating that the only valid version of the Propy NFT ownership document, which is timestamped, is the version that has been amended with the changes introduced with the transfer of the NFT to a new owner. Thus the only valid version of the Propy NFT ownership document will contain the name of the current owner of the NFT.
2. Propy will modify the "transfer" function of the NFT smart contract in order to affect the modification of the Propy NFT ownership

document described above every time the auction house activates the transfer function and provides the wallet public keys of the two trading parties.

3. Upon execution of the P2P transaction, whereby the payment is transferred to the wallet of the NFT seller, Propy will collect identification information from the NFT buyer in order to complete the transaction and transfer ownership to the buyer of the NFT.

The result of the above procedure is an always-current Propy NFT ownership document, which will at any time contain the name of the current owner of the NFT as the owner of the structure.

**Property owner hires Propy to NFT their property.  
Propy verifies ownership.**



**Property owner signs Propy's NFT-suitable US-based paperwork. The structure designates Propy as an Administrator.**



**Propy guides property owner to transfer deed to a structure. Title insurance issued.**



**Propy, acting as an Administrator, creates an NFT smart contract and stores paperwork on decentralized storage accessible by NFT smart contract.**



**Propy lists NFT for sale on a Propy auction site.**



**Propy whitelists winner and links the name of the winner to the wallet address.**





**The NFT owner automatically becomes the owner of the entity after a KYC/AML process. Propy protocol and the seller receive royalty fees from each bid and trade.**



**PRO payment unlocks the registration of the winning bidder into the digital ownership paperwork.**



**New NFT owner can re-list the NFT for sale. Subsequent NFT buyer automatically becomes the owner of the property, as long as Propy whitelists the winner.**



**The NFT owner is the owner of the entity that owns the asset and thus can possess and use the property.**

## **Propy as an administrator:**

Propy as an administrator has no rights to the ownership of the entity or the real estate asset, and will act in good faith or will face liability as per the US corporate and criminal laws.

## **1031 exchange compliance for US investors:**

As a pass-through entity for tax purposes, a structure holding the real property is 1031 exchange compliant. The NFT-ed structure will continue to be 1031 exchange compliant. In other words, an investor can sell a home and buy an NFT or sell an NFT and buy a home in a tax-deferred 1031 exchange, as long as he or she satisfies the 1031 exchange requirements (for example US properties cannot be exchanged for foreign ones, etc.)

## **Whitelisting:**

an NFT buyer will be whitelisted after running AML/KYC procedures on him or her and before being allowed to enter paperwork.

Listing the NFT for trade: an NFT can be listed for trade either on NFT auction-based marketplaces that KYC users or on a Propy-operated auction facility.

Re-listing the NFT for trade: the new owner of an NFT will have the NFT in his or her crypto wallet and thus will have the ability to re-list the NFT at any time on the same or on another NFT exchange.

## **“Burning” of the NFT:**

the current owner of an NFT can “burn” the NFT in a procedure that will have two elements: the blockchain “burn” element and the legal element, i.e. the transfer of the property ownership from the structure to the current owner of the structure or to a third party chosen by the current owner of the structure.

## **Property taxes:**

many governments require registration of changes of ownership of legal entities holding property located in their jurisdiction after the transaction. Propy is facilitating this service.

## **Fraud prevention:**

There are two kinds of fraud that can happen: (1) The first kind is the preparation of a fraudulent Propy NFT ownership document containing a false name in place of the owner of the structure. This can be prevented by a legal clause defining the current “on-chain” copy of the Propy NFT ownership document as being the only valid form of the agreement.

In the absence of a clause restricting the valid form of the agreement to the “on-chain” version only, the Propy NFT ownership document can be printed and physically be presented to the transfer agent (title company) for a conveyance of title. But this method introduces the risk of fraud by an intermediate, temporary owner of the NFT who can print the agreement with their name as the owner while holding the NFT. Of course, this risk exists even when such a clause is included because the individual committing fraud can always remove this clause from their fraudulent printed version, but Propy can publicize the paperwork and the NFT description can contain warnings about the existence of such a clause.

The second kind of fraud is the listing for the trade of a fake NFT with the same name and description as the real one and pocketing the winning bid money. The best way to prevent this kind of fraud is to provide a facility to potential bidders which will distinguish the earlier time-stamped NFT as the genuine one.

## **Administrative services:**

For frequent trading, Propy will keep track of changes of ownership so as to allocate/apportion and charge tax obligations and apportion and transfer rent payments. The “charging” of expenses can be made against a security deposit required for each trader whom Propy whitelists and by providing a user-friendly interface with credit card/crypto payments.

These auxiliary services have nothing to do with the transfer of ownership rights, which are fully and autonomously transferred P2P every time trade of the NFT happens. These services must be expressly restricted to “ministerial and routine tasks” and not to the management of the investment, i.e. without any discretion for control of the investment, in order to avoid getting into securities laws territory.

## **Title Insurance:**

The original homeowner's title insurance in most cases will pass to the structure with an endorsement, but this is dependent on the particular policy and property location. As an alternative solution, crypto title insurance is applicable.



# Propy NFT Marketplace

Based on smart contracts. Product that accepts fiat and crypto payments. A critical part of the platform is KYC and AML (...) of each bidder and the winner in the auction to avoid any violation of the legal framework. The current NFT marketplaces are not allowing KYC-ing users. In real estate however we need to know the real names of the buyers. Propy marketplace requests names and addresses of bidders to further secure instant ownership transfer.

NFT Marketplaces facilitate the exchange of assets anonymously. However, real estate markets require the real names of the buyers and sellers in order for transactions to comply with regulatory regimes. The critical component of the Propy Marketplace is the inclusion of KYC and AML protocols to ensure crypto real estate transactions without violating these legal frameworks.

# TOKENS in the NFT marketplace

The tokens are an essential part of ownership transfer in Propy Registry for any type of transaction (traditional in dollars, in crypto or as an NFT). Tokens are also an integral part of the learn and earn approach for market participants to incentivize them to join the network, and/or contribute data and/or invite other participants. Tokens are charged for transactions settlement, including NFT transfer, as well as for data access in the Propy ecosystem, such as analytics around offers, bids and transactions on Propy, price prediction etc.

Full Token economics is described in the Whitepaper 1.0 2017.

# Price Prediction

Our vision is to bring never-before-seen transparency to the real estate prices.

Using game theory, the power of market sentiment, and the decentralized blockchain technology, the system “crowdsources” market predictions. With Propy’s Price Prediction, users will be able to predict future real estate prices. Once official statistics become available at the end of the “prediction moment,” the users with the closest guess will receive the reward from the prediction staking pool.

Real estate buyers and investors deserve never-before-seen insight into real estate market prices to ensure they’re entering the market at the most opportune moment. Real estate is an excellent application for prediction markets since property price discovery is currently very opaque.

Propy’s Price Prediction is a proprietary technology for crowdsourced price prediction for properties -, whether they will be listed on MLS or as an NFT on Propy. Licenced realtors will be able to predict the price after they visit the estate and get rewards after the sale if they guessed the price with 3% variation. This will allow to predict prices for the seller according to the current state of the local market, and price the property accordingly.

# Long-term vision - NFT-ing real estate in the US

In this paper, we are presenting the concept of NFT-ing real estate, and gradual de-attachment from the governments' land registration processes. This is possible if gradually real estate assets will be transferred to legal entities, which is a common practice in the US already amongst homebuyers requesting privacy. As the assets will be transferred to legal entities that are tied to NFTs, the county records will contain the record of the entity as the owner of an asset in perpetuity. When the sale occurs the entity remains the same, but the owners of the entity will be changed according to the sale of the NFT. Thus, no record in the county is needed. The records of change will be stored on the blockchain. Taxes are still owed. Title insurance is attached to the entity. If any risks are involved in the new process of transacting it will be covered by the crypto title insurance, which will be more effective and more affordable and will rely on blockchain protocols, see below.

The solution is similar to a product known as Carta, which keeps ownership of legal entities independent from government while following regulations. Propy follows a similar approach for homeownership.

# DEFI for NFT-ed real estate

Once it is possible to NFT part of or an entire property, the NFT will become collateral in the crypto world which unlocks “crypto mortgages” and “crypto HELOC.” To make NFT ownership secure, a “crypto-insurance fund” is the next piece that the industry requires. To make the crypto mortgage and crypto HELOC scalable and feasible, “crypto appraisal” instruments will have to be created. NFT, DeFi, crypto title insurance, and crypto appraisal will create a full cycle for the new age of liquid real estate. Propy is committed to creating this revolution with its own technological and legal solutions as well as via partnerships.

# NFT of 20% of a Property

Imagine a world where people own an NFT of Larry Ellison's island, or NFTs on Elon Musk's house, or on SpaceX property, or even a piece of Mars. Propy is developing a vehicle for homeowners to keep 80% of their house, and sell off 20% as NFTs. Then the new buyers could trade portions of the house, but the homeowner keeps 80% of the upside. When the house turns over, the NFTs would have the option to hold or sell. Privacy of the owners should be taken into consideration, where Propy systems know and verify the address but it's not discoverable by the public for celebrity homes.

Once homeownership (entire or fractional) is turned into an NFT, one can borrow against this asset similarly to HELOC (see next chapter) or sell a portion of it. For the fractional sale of a property, in the beginning, Propy will do it through Reg S exemption, which is restricted only to non-US investors and Americans living abroad. (Selling portions of a home to US non-accredited investors can be offered further by Propy or other companies, with filing with SEC under Reg D or Reg A for assets under \$50m in value.)

# Borrowing Against NFT-ed Home Equity

Since the late 1980s, home equity loans and home equity lines of credit (HELOC) are popular loans that are secured by a borrower's home. Nowadays a consumer can apply for HELOC through a bank or a lender, but the interest rates are still high.

Now with the development of DeFi and NFT we have the opportunity to fully democratize the process, and make home equity financing what Airbnb did to home-sharing and Robinhood to stock investing. If the home equity is represented by NFTs and accessed on Propy's NFT marketplace, consumers and retail investors can easily turn into borrowers and lenders, and can access cheaper and faster financing, and benefit from the profits that are now available only to institutional investors.

## Benefits for Consumers

1. Provide an accessible source of available cash faster than banks and traditional lenders.
2. Affordable financing: The interest rate on a home equity loan at the moment is from 2.5% to 21%, with Propy it can be significantly lowered, starting at 1%.
3. Consumers get a single payment and a lower interest rate while keeping their tax benefits

## Benefits for Retail Investors (Lenders)

Home equity loans were always a dream come true for the banks and other institutional lenders. With Propy's NFT Home Equity everyone can turn into a lender and start earning interest income on the home equity debt. If the borrower defaults, the lender not only gets to keep all the money earned, but also gets to repossess the property, sell it again, and restart the cycle with the next borrower.

## **Appraisal**

The main challenge for the concept is property evaluation and speed of appraisals. As real estate becomes more liquid via NFTs, appraisal technology backed by cryptographic algorithms and crowdsourcing, similar to the price prediction models such as Augur and Gnosis, will make it quick and efficient. The crowdsourced price prediction solution is described above.



# Crypto Title Insurance Fund

The title industry is not efficient yet due to a lack of data integrity when it comes to ownership data traceability, liens, and other potential claims origination databases. Regular title companies have 6% claims, thus this business has high margins. As the industry moves to blockchain records, the industry will have fewer and fewer claims, very quick resolutions, and immediate title search. This is why insurance funded by the crypto community makes sense.

Initially, the insurance will be offered only to cash buyers because mortgage providers require traditional title insurance, while cash buyers are not required to buy title insurance. Any crypto holder can contribute to the insurance fund and get a return. Network participants who execute title searches will be title miners and will earn Pro tokens if they are a correct oracle provider or a penalty if their data is wrong.

As all transactions are on blockchain and more oracles are integrated into Propy (such as divorce registry, title plants, liens data providers, etc) the insurance will lower in price and the fund may shrink in the US but would expand in developing countries, as their infrastructure does not have reliable historical or current data.

# Decentralization and longevity of Propy

Propy aims for a fully decentralized marketplace for real estate assets. This means that the market participants will own the network. The data stored won't be dependent on one point of failure.

All files will be stored on a distributed storage (IPFS) at the next stage. If Propy were to close its operations, the transaction participants will have private keys to all their documents forever. If a buyer loses a private key, they can reach out to agents or brokerages to access data. For the time being Propy will always be able to identify the user and provide the transaction data upon request if passwords or private keys are lost. There will not be a case where ownership is locked into a digital wallet with single access to a private key, which could be lost together with ownership.

One day real estate assets will be listed on a decentralized marketplace, they will be traded easily and securely, in any currency, cross-border. Prices will be predicted by local market experts. Any flaws in the system will be insured by a crypto-enabled insurance fund. After properties in the US are NFT-ed at scale, NFT real estate funds will emerge. New type of financing will facilitate an easier mortgage process, which is also crypto-enabled. Real estate NFT will be a collateral. Real estate assets will be tracked via blockchain systems instead of government's ones.



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