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Non Fungible Tokens for Residential Real Estate

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ELPP Spring 2022

INTRODUCTION

Background

Non-fungible tokens (NFTs) are unique units of data stored on the blockchain where each unit of data represents an asset. By design, the NFT ledger certifies the authenticity and provides proof of ownership of the asset. While most commonly known for its use in digital forms such as digital art, music, and in-game collectibles, NFTs can also be used for assets in the physical world. Combined with smart contracts (computer programs stored on the blockchain that are automatically executed when contractual terms are met), NFTs can streamline established industries in the physical world that still primarily rely on archaic processing pipelines. One such market is the residential real estate industry—colloquially, home buying.

Problem with Home Buying Today

The home buying experience today is a really painful, slow, and expensive process. Each step of the home buying process consists of insurmountable paperwork and human intervention, both of which are subject to gaps in authenticity and efficiency due to human error. Each additional service comes with its own costs, not to mention the costs to recover unintentional mistakes as well as intentional fraud.

Approach

NFTs will enable real estate liquidity. The home buying process can be simply put into three problems that can be addressed by NFTs: proof of ownership, proof of authenticity, and transfer of ownership. Applying NFTs to the home buying experience will enable real estate liquidity, invite new investors, and transform existing home buying processes. This paper explores how the NFT-based process compares to the current process and how NFTs will disrupt the residential real estate market.

NFT and HOME BUYING

Current Buying Experience

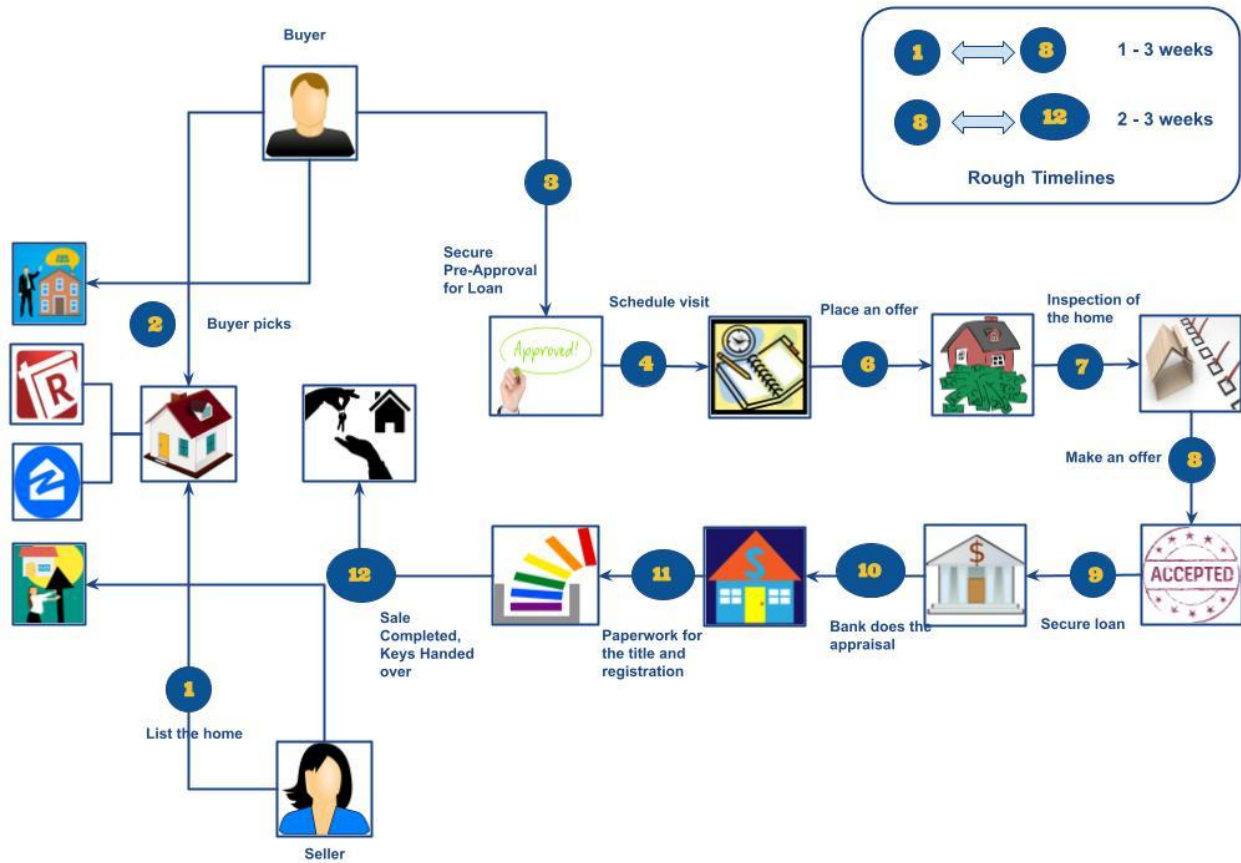


Figure 1. Current end to end home buying process

The home buying experience with the current process is manual, slow and inefficient (Figure 1).

The following captures the steps involved in residential purchase:

- Buyer secures pre-approval from the bank of his/her choice
- Works with the buyer's agent to setup the visit to see the property
- Buyer make the offer through seller agent
- Seller needs to accept the offer.
- Seller and buyer's agent initiates the sale agreement between the buyer and the seller.
- Buyer's agent initiates the inspection, validates the proof of ownership and legal records.
- Buyer and Seller agents work with the Title & Escrow agent to initiate the escrow account to initiate the transactions.
- Agents review the records with the country office.

- Once the Title and Sale agreement are signed and ready, the buyer needs to release the funds to complete the transaction.
- Title change is registered in the county office.

While NFTs can be used to replace all of the manual steps and improve the overall user experience, this paper will focus on the process to verify title and ownership (*Figure 2*).

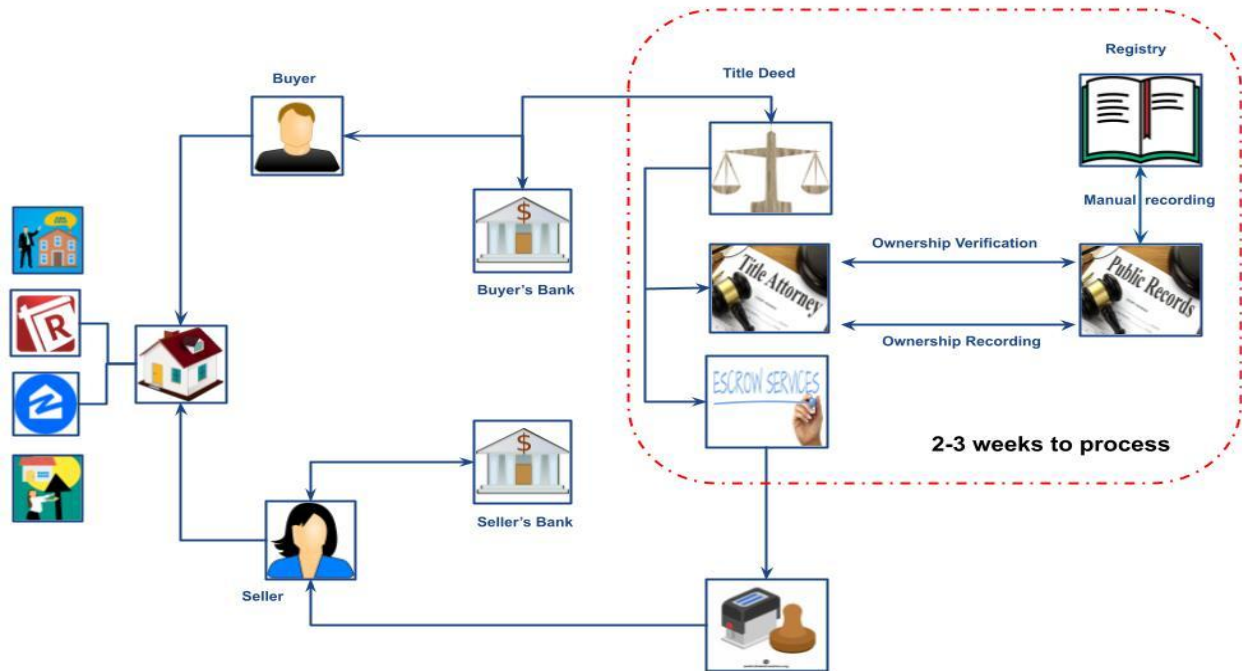


Figure 2. Home buying process before NFTs, focus on title verification and ownership process.

Smart Contracts to the Rescue

Smart contracts are contracts that are written as computer programs stored on the blockchain. Unlike paper contracts, smart contracts are fully automated and self-executing. It does not need an intermediary party to determine whether contractual conditions have met, nor does it need a third party to carry out the contract terms.

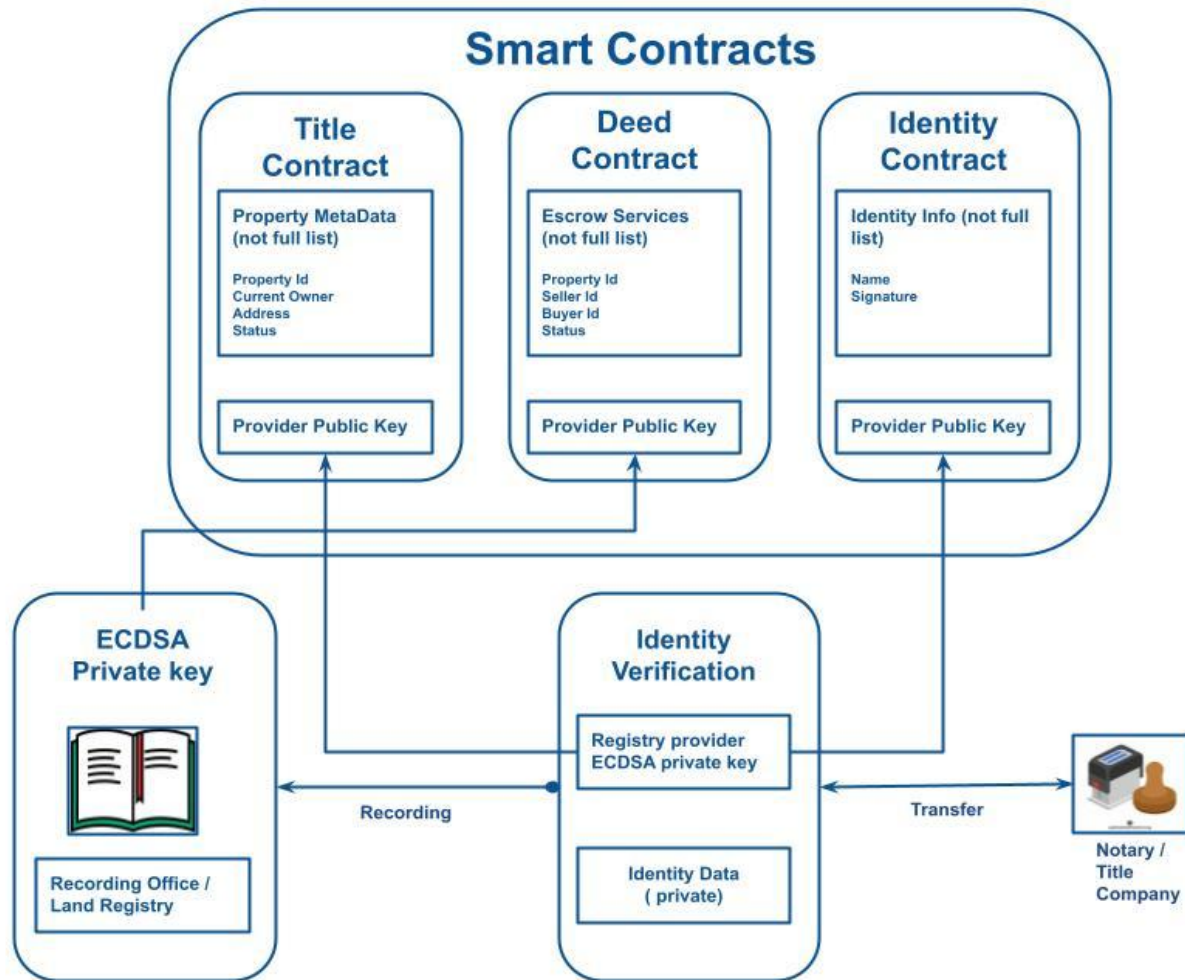


Figure 3. Smart contracts to replace title, deed, and identity contracts

In the NFT approach, the paperwork with the sale / purchase agreement, the title and the deed contract will be smart contracts wrapped as an NFT token signed by the marketplace provider's private key (Figure 3).

Purchase Flow with NFT (Fiat Option)

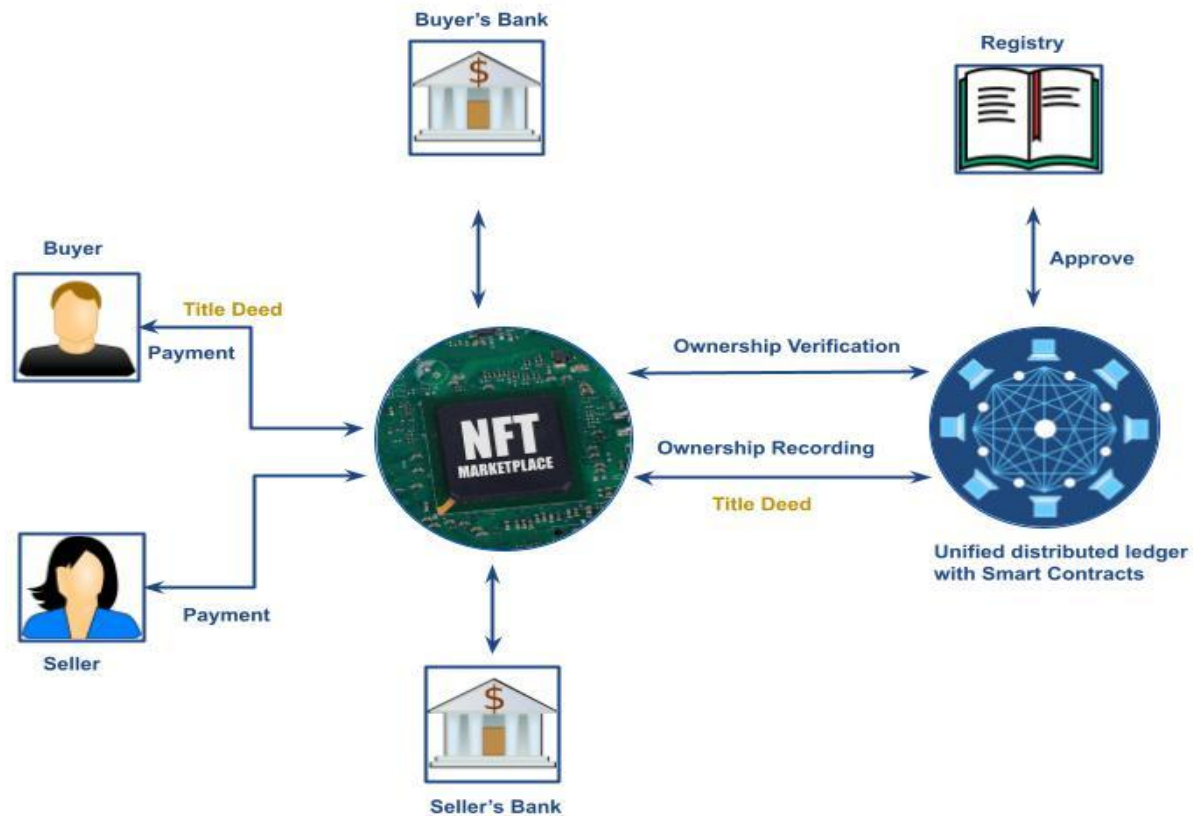


Figure 4. Home buying process with NFTs, using fiat currency as the payment option.

Once all the contracts and paperwork are wrapped into the token, the buying experience is simplified to the steps below:

- Buyer selects the property in the marketplace.
- Purchase and Sale agreement is generated and sent to buyer and seller.
 - Ownership verification is done by the Marketplace provider.
 - Buyer and seller receive instant notification when the verification is completed.
- Once the seller accepts, the sale agreement is executed electronically and registered into the token.
- Once the escrow payment is done through the bank loan or cash, payment record is registered to the smart contract.
- Marketplace records sale details by sending the blockchain hash to the recording office.
- Once a Title deed with escrow agent is signed, a new electronic title deed with blockchain hash is issued.
- Recording office will issue the physical title deed to the buyer.

Purchase flow with NFT (Cryptocurrency Option)

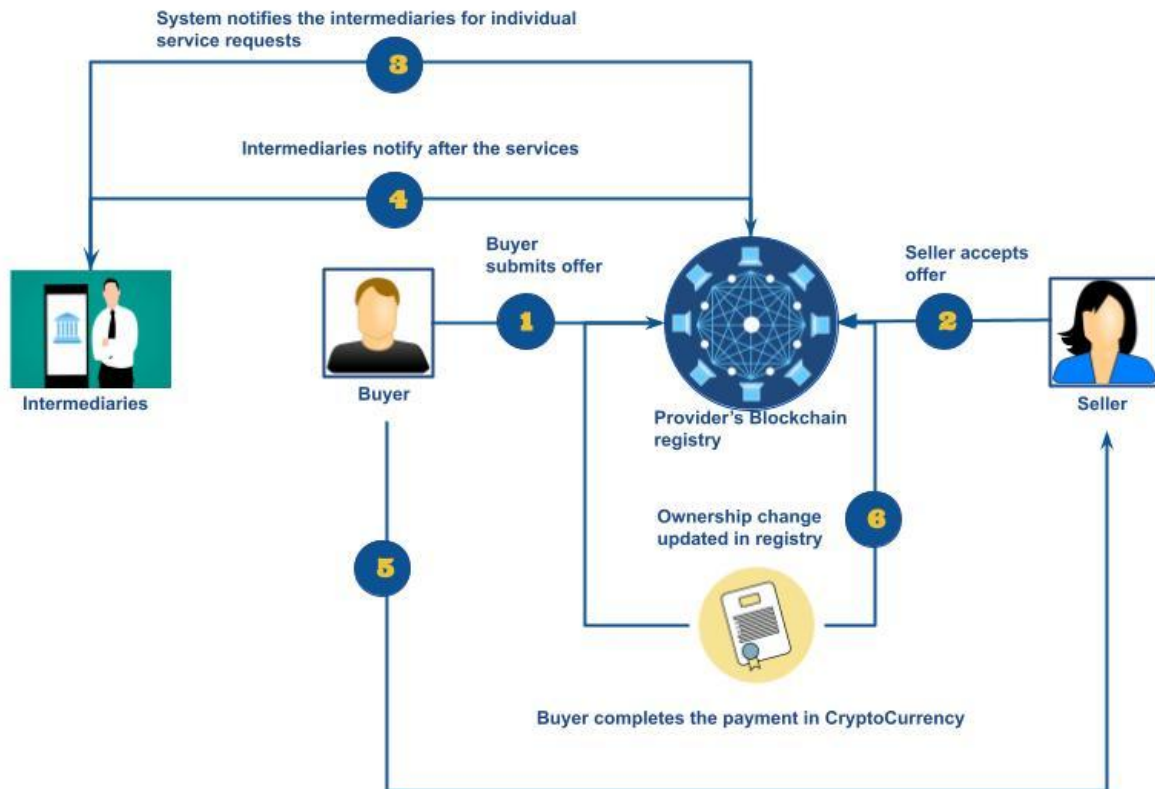


Figure 5. Home buying process with NFTs, using fiat currency as the payment option.

In addition to the use of NFT technology to replace the paperwork, adopting cryptocurrency as a mode of payment will further reduce the processing times significantly. If the buyer and seller are ready to transact with cryptocurrency then the flow will look like:

- Buyer selects the property in the marketplace.
- Purchase and Sale agreement is generated and sent to buyer and seller.
- Once the seller accepts, the sale agreement is executed electronically and registered into the token.
- Marketplace performs the KYC on the buyer to check the creditworthiness.
- Once KYC is done, the payment contract is baked into the smart contract.
- Buyer initiates the down payment through the cryptocurrency to the Marketplace.
- Marketplace records sale details by sending the blockchain hash to the recording office.
- Once a Title deed with escrow agent is signed, a new electronic title deed with blockchain hash is issued.
- Recording office will issue the physical title deed to the buyer.
- Marketplace issues the payment to the seller as cryptocurrency or fiat based on the buyer's choice.

Benefits

Buyers and sellers directly in control: The benefits of blockchain and NFT could provide the confidence buyers and sellers need for transferring their assets. Buyers could also find opportunities for borrowing against their real estate NFT on Defi or traditional finance solutions on blockchain. As a result, NFTs can also simplify the process of taking out loans on your property. The integration of NFTs in the picture empowers buyers to take control of ownership of real estate within minutes.

New investment models– fractional ownership: A fractional NFT is simply a whole NFT that has been divided into smaller fractions, allowing different numbers of people to claim ownership of a piece of the same NFT. The NFT is fractionalized using a smart contract that generates a set number of tokens linked to the indivisible original. Applying the same fractionalization to real estate, fractional ownership of property could become more common, opening up new investment models for the average investor.

Bring in global investors: With NFT-provided liquidity, the real estate market can be opened up to more global investors. Any investor across the world can easily and reliably invest in real estate.

Death of foreclosure: The biggest advantage with NFT is changing the nature of some of today's real estate processes, specifically the foreclosure. With the traditional mortgage process, banks opt in for auction if the monthly installments are missed and this leaves the buyer losing the property and also all the money that was invested.

Challenges and Risks

NFTs in residential real estate are new, which means its potential is as clear as its current risks and challenges.

Business Challenges

- Skepticism: The average homeowner remains skeptical of NFTs in the home buying process. Public opinion on NFTs in general is split. Home buying is an important commitment that the average buyer would not want to place on technology they are skeptical of. However, with more experiments taking place, investors will better understand the strengths and weaknesses of NFTs and where NFTs can or cannot be applied within the real estate industry.
- Non-uniform government regulation: There is no uniform regulatory guidance on NFTs, though a few countries have created laws that could hold NFTs under their purview. Every country has its own set of regulations. In the US, FinCen has not issued any

guidance specific to NFTs, but it has published guidance generally about how the BSA and FinCEN regulations relate to virtual currency that could apply to NFTs.

Technology Challenges

- Energy costs: NFTs are not good for the environment. Over time, the effects of producing NFTs, or all types of cryptocurrency will have a tremendous negative long-term effect on our environment.
- Cyber threats: NFTs are already attracting criminals who are trying every possible way to obtain the private key associated with an NFT to gain access to the token and move or sell it without authorization from the real owner. As stolen NFTs reside on immutable blockchains, getting the ownership back is not easy.

Marketplace, Ecosystem, and Current Players

Within the **NFT ecosystem**, there are two main technical problem spaces to address:

1. Physical asset tokenization: NFTs exist in the digital space, but could be used to represent physical assets. Technical solutions are needed to define how to create these digital tokens and properly assess, measure, and affirm the value of a physical asset. Example companies that provide solutions for physical asset tokenization include:
 - a. *RealT*: system for tokenizing real fractional and frictionless real estate
 - b. *Centrifuge*: tokenization and fractional ownership of real world assets
2. Marketplace and transaction processing: An NFT marketplace is a platform where NFTs can be indexed and traded. Example companies that provide marketplace and transaction processing services for real estate using NFTs include:
 - a. *LoanSnap*: NFT mortgage loans backed by Bacon protocol and BHome coins
 - b. *Propy*: marketplace and payment processing/distribution
 - c. *LandOrc*: blockchain enabled marketplace for capital and collateral movement

The **residential real estate ecosystem** consists of companies can be categorized in the following ways:

1. Marketplaces: platforms and systems that connect the buyer, realtors, brokers, and other parties involved in the home buying process
2. Brokerages: businesses that manage the real estate sales and purchases processes.
3. Established franchises: large, well established corporations that participate in or have subsidiaries in various sectors of the home buying process.

Many established franchises have publicly committed to lead their business into the NFT space, for example:

1. *Coldwell Banker* has announced a partnership with Coinweb for a real estate tokenization pilot in Thailand. If the proof of concept is successful, Coldwell Banker will introduce the NFT based model to its other global branches.

2. *First American Financial* and *Old Republic Title Insurance Group* have announced their partnership in introducing a shared blockchain system for title insurance processing. While many established franchises have entered the NFT space, not as much movement has been observed from marketplaces and brokerages such as *RedFin*, *Trulia*, *Zillow*, etc. However, these companies' operating models are already fully digital, which would significantly reduce the barrier of entry into the NFT space.

Market Size

The market opportunity in real estate is more than substantial. The global real estate market size is \$200T, of which \$29T resides in the U.S. The U.S. residential real estate market can be broken down further into the following spaces:

- \$28B in property owned by Chinese investors
- \$22B in the title insurance industry in 2022, expected to increase by 1.2%
 - \$2B - \$4B of losses due to fraud
 - \$1.2B in costs for title insurance processing and production services
 - \$469M in claims due to inaccuracies, 30% of all title insurance losses are due to fraud

By adopting NFTs, the more robust and automated system would cut costs of service and save from losses due to fraud and mishandling.

Real estate liquidity through NFTs opens up the U.S. market to more foreign investors as well as provides domestic investors more global opportunities.

CONCLUSION

The tedious process of home buying today is one that paired with inauthenticity, high costs, and low efficiency. NFTs solve exactly that. Though NFTs in real estate will look like “technology play” in the beginning, as more established franchises move into the NFT space, business models for the real estate industry will evolve in favor of liquidity. Ultimately, liquidity will lower the barrier of entry into real estate markets, making real estate markets borderless.

As new, smaller companies emerge in the NFT and real estate space, the current big players will acquire the new players to help modernize their existing platform and offer cryptocurrency. Through partnerships and acquisitions, the big players' commitment to NFTs will push new policies and regulations that recognize NFT based real estate platforms as the new standard.

RESOURCES

- <https://www.goldmansachs.com/investor-relations/financials/current/annual-reports/2016-annual-report/annual-report-2016.pdf>
- <https://www.forbes.com/sites/nataliakarayaneva/2021/04/08/nfts-work-for-digital-art-t hey-also-work-perfectly-for-real-estate/?sh=14994f6b43f3>
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