

PROPY

GLOBAL PROPERTY STORE WITH DECENTRALIZED TITLE REGISTRY

WHITE PAPER / JULY 17th 2017

PROPY TEAM

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PROPY

ABSTRACT:

This whitepaper describes a comprehensive platform for remote online real estate transactions using Smart Contracts. Propy is a proposed implementation of this platform, which intends to reduce reliance on intermediaries while improving liquidity and security.

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1. INTRODUCTION

1.1 BACKGROUND

Throughout history, real estate has arguably served as the most stable store of value. Together with labor, as Adam Smith noted in The Wealth of Nations, land serves as not only a store but a producer of wealth[1]. Real estate's popularity over the years has been derived from the fact that not only is land typically an asset which nearly always appreciates in value, but also is often an income-producing asset, generating further capital wealth for its owners. While beneficial for 16th-century nobles to find a safe place to store value, real estate's illiquidity nowadays presents significant inefficiencies for investors, especially those buying properties abroad. Despite these inefficiencies, the overseas property market is significant and growing. Between 2009 and 2016 the demand for cross-border real estate transactions increased 334% from $65 billion to $340 billion[2]. We believe this market should be and can be much, much larger.

1.2 THE PROBLEM

Today, the global real estate market is worth $217 trillion and makes up more than half the value of all mainstream assets worldwide[3]. One great differentiator between real estate and other major asset classes is liquidity. Compared to exchange-traded securities such as equities and government bonds, real estate markets are not as organized or efficient as other markets, with incredibly slow transaction times and less efficient price discovery mechanisms. As a result, substantial capital is trapped in less liquid investments, often concentrated in certain geographic areas devoid of domestic investment opportunities. While many investors with excess liquidity would welcome the opportunity to invest in foreign real estate assets, there are currently substantial impediments to such investment activity.

China is an excellent example of this problem. Currently, Chinese citizens are among the largest groups of foreign investor in the U.S. real estate

[1] Smith, A. The Wealth of Nations. 1776.
[2] Savills, Around the World in Dollars and Cents. 2017.
[3] Savills, Around the World in Dollars and Cents. 2017.

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market. Chinese investors own over $28 billion in U.S. residential property[4]. However, the total value of the U.S. residential real estate market is over $29 trillion[5]. Foreign investment in the U.S. residential sector could be potentially equal to hundreds of billions of dollars if foreign investors were properly educated on how to invest and provided with the facility to, among other things, close real estate transactions online. In the current market, Chinese who intend to invest in foreign real estate mainly rely on family and friends to obtain referrals to local brokers, who in turn work with international brokers in selling a property. This process is time-consuming, involves too many intermediaries, and often, the property the buyers are seeking for is sold to another investor before the process is complete.

The core of the problem is the lack of international standards or comprehensively available platforms for the electronic transfer and recording of real estate. Each country (and in some cases, as in the United States, even individual counties) maintains its own registry and establishes national (or local) rules for property deed registration and transfers. Moreover, legacy property rights registry systems were developed to handle local real estate transfers but are ill-equipped to handle international ownership transfers. As a result, there is an inferior experience for people on both sides of the marketplace. Additionally, the informality of procedures prevalent in certain jurisdictions makes them particularly susceptible to fraud or tampering. There is currently no single tool available that allows a property investor to research, pay for, and reliably secure and record ownership of international property online.

1.3 THE SOLUTION

Propy aims to solve the problems facing international real estate transactions by creating a novel unified property store and asset transfer platform for the global real estate industry. Initially the Propy Registry will mirror official land registry records in which transfers of real estate are recorded. Ultimately, however, Propy's vision is that jurisdictions will adopt the Propy Registry as their official ledger of record such that the transfer of a property on the

[4] Global elite buys trophy apartments. Financial Times. 2015
[5] How Much is Every Home in America Worth? A Lot. Zillow Research. 2016

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Propy Registry constitutes the legal transfer of the property and the legal registration of that transfer. By leveraging Propy Registry and Propy's smart contracts platform, unnecessary delays and impediments inherent to legacy property rights registrations systems could be eliminated. The Propy platform seeks to enhance the security of transactions while reducing inefficiencies through its innovative use of mobile, cloud and blockchain technologies linking buyers, sellers, investors and registries around the world.

1.4 BLOCKCHAIN AS A NEW STANDARD FOR PROPERTY REGISTRIES

Blockchain technology holds great promise for a range of industries and use cases, including real estate. A blockchain is a type of shared database, the contents of which are verified and agreed upon by a network of independent actors. In order for a new piece of data (such as the new owner of a transferred property) to be added to the blockchain, the independent verifiers must come to consensus as to its validity.

Because each new set of transactions (a "block") is cryptographically linked to the previous block, it is extraordinarily difficult to change data stored in a blockchain and any such change would be readily detectable. Thus blockchains are widely considered to be immutable and thus can serve as a record of proof of ownership.

When transacting in a blockchain platform, each user makes use of a public address (needed for other actors in the network to send a transaction to that user), and a cryptographically paired "private key." Private keys are used to sign transactions digitally, a form of authentication to ensure that a given user has genuinely generated a transaction.

Blockchain is a relatively new technology. The first implementation of blockchain, Bitcoin, launched in 2009. The Ethereum blockchain was released in 2015. In addition to the distributed ledger capability of the Bitcoin blockchain, the Ethereum blockchain allows so-called "smart contracts," which are programs stored in the Ethereum blockchain that can act autonomously to execute sophisticated transactions[6].

[6] "Ethereum Whitepaper", https://github.com/ethereum/wiki/wiki/White-Paper, 2016

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The rise of Ethereum and other smart contract platforms has allowed the creation of decentralized applications, or DApps. A DApp is an application whose entire or partial backend code runs on a decentralized ledger with a user interface to facilitate interaction with the blockchain code[7]. Code written to the blockchain is publically accessible, and since the code is running on multiple computers, there is no central point of failure.

Blockchain is currently considered one of the most secure technologies for digital asset transfer due to its distributed nature and use of sophisticated cryptography. Smart contacts, therefore, offer a potential solution for the management of real estate transactions via the introduction of a universal, distributed ledger that does not require trust in a single third party.

1.5 TECHNOLOGY LIMITATIONS

The main limitations of blockchain technology today are:

1. Transaction time, which is currently ten minutes on average for Bitcoin (blockchain.info) and seventeen seconds on average for Ethereum (ethstats.net);
2. The cost for each transaction/smart contract execution; and
3. The limited ability of the network to interface with real-world information.

Despite these limitations, Propy believes that blockchain technology is well suited as a solution to conduct real estate transactions, because the number of transactions in real estate trading is relatively low due to the nature of the sector and the relatively high value of real estate assets. In addition the current transaction time for recording on blockchain is not a limitation for the Propy's solution because otherwise it requires weeks or months to acquire a property and complete a transfer of ownership.

[7] "Your First DApp", https://dappsforbeginners.wordpress.com/tutorials/your-first-dapp/, 2017.

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1.6 SMART CONTRACTS FOR THE EXISTING LEGAL FRAMEWORK

Propy's engineering team has designed a real estate transaction tool powered by smart contracts, combining solutions from the legal, blockchain and payments industries. Using blockchain technology, Propy has prototyped some of the core technology that will become the Propy Registry as a DApp that allows each party to a real estate transaction — including the broker, buyer, seller and title agent/notary—to sign off on a transaction for properties located in California, which is Propy's intended first market. The workflow of the processes has been built to meet the market rules within the legacy property rights registry systems currently existing in the state of California. The goal of launching the Propy platform only in California at first is to allow the current prototype to be narrowly focused on driving consumer testing, adoption and improvements within a closed test market. Thereupon, Propy will seek to implement the Propy solution and drive continuous rapid growth throughout key markets around the world.

Ultimately, the Propy Registry will make it possible for every single step of a real estate transaction, from the buyer's reservation of the property to the signing of the purchase agreements for the delivery of the title deeds, to be recorded on blockchain and executed with smart contracts.

However, due to blockchain's new and innovative nature, Propy recognizes the existence of regulatory and infrastructure limitations in the current technology as applicable to real estate transactions and is in the process of building a multi-stage solution to be gradually phased in over time.

The first iteration of the Propy DApp (which includes a centralized interface and decentralized smart contracts) intends to streamline existing real estate market processes by, among other things, reducing the need to rely on the multiple intermediaries currently involved in the real estate transactions. While aspects of the process will be partly decentralized, it will primarily make the current real estate transfer process easier to manage and more transparent. As it develops, Propy intends to transition towards a pure P2P decentralized system that obviates the need for most of the existing intermediaries involved in real estate transactions today. We note that certain intermediaries performing physical functions such as property inspection will remain part of the transaction process at least in the immediately

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foreseeable future. The final stage in that evolution would be the adoption of the Propy Registry as the legal ledger of record for real estate title transfers in a given jurisdiction. Based on the founders' many years of cross-border property purchase experience to date, we anticipate that emerging markets, hungry for investments in real estate and less encumbered by entrenched special interests, such as bureaucracy, corruption and too many intermediaries, will see the benefits of a pure P2P transaction model. Propy has already begun the process of accelerating this transition across multiple metropolitan markets by talking to governments, local lawyers and local real estate players. The team has developed a network of brokers in the UAE, UK, U.S. and a pipeline of international customers from Asia.

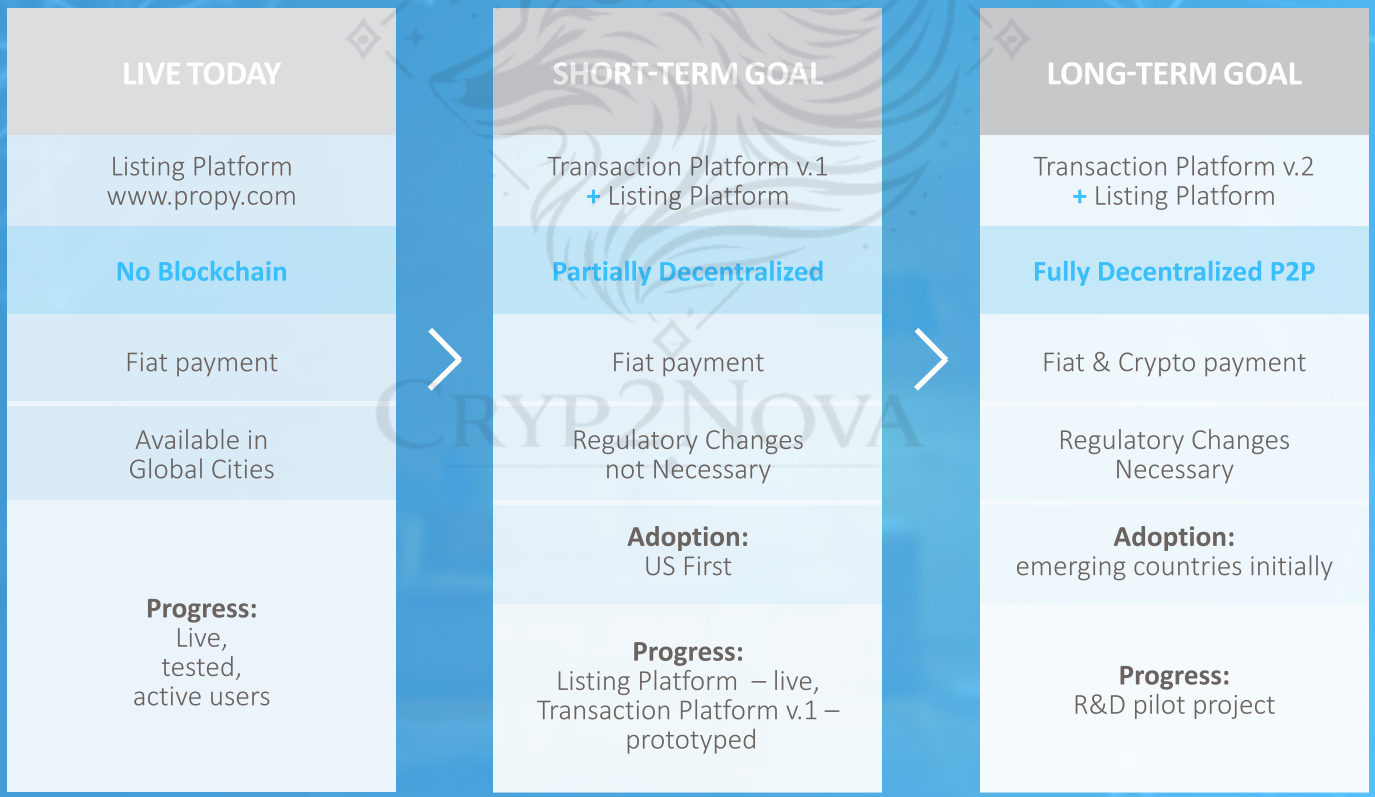


FIGURE 1. Development Roadmap.

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1.7 TOWARDS A DECENTRALIZED P2P SYSTEM

Traditionally, international standards are established via conventions, laws and regulations enacted by governments. As a result of the lack of standards with international scope, the current electronic land title registry solutions function as multiple incompatible sets of siloed data which must be manually parsed and translated to work with external platforms. The Propy Registry can solve that problem. In order to do so, and for the Propy Registry to ultimately deliver on its full promise, it will need to transition from a ledger that mirrors official land registry ledgers to being the official ledger of record.

For a government to adopt this technology, it would need to recognize the legality of the electronic deeds and the ledger. Propy is actively engaging with local and state governments to accelerate the acceptance of the Propy Registry as a legally valid ledger of record for real estate transfers. Additionally, Propy is working with the governments of several emerging countries where, due to systems' inefficiencies, corruption and the lack of regulatory complexity, a transition to a new system is expected to be more straightforward; the specific countries to be disclosed in due course as partnerships are confirmed.

1.8 REGULATION CHANGE

There are two possible legislative environments we are currently preparing for:

1. The first one would be the current context, where governments recognize their legacy databases as the exclusive legal evidence of ownership. In this environment, Propy intends to initially conduct business and thus, the current development of Propy is geared towards mirroring government records in the blockchain with the goal of providing a platform for foreign real estate investors to conveniently and remotely carry out property transactions. The Propy Registry acts as a source of fast delivered evidence of property transfer for brokers and serves as a mirror of the ownership transfers currently taking place at the title registries of the targeted markets (U.S., UK, UAE). Brokers who focus on foreign real estate investments, have expressed the need to have available technology that could allow

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the online processing of real estate purchases with the additional layers of security that the Propy Registry intends to provide.

2. The second legislative environment would arise when progressive governments start recognizing the benefits of ownership transfers on blockchain as a more desirable alternative instead of trying to continue to enhance the existing real estate registries. The widespread adoption of a blockchain system to manage real estate titles positions Propy to provide a sole, decentralized source of validation for real estate transactions.

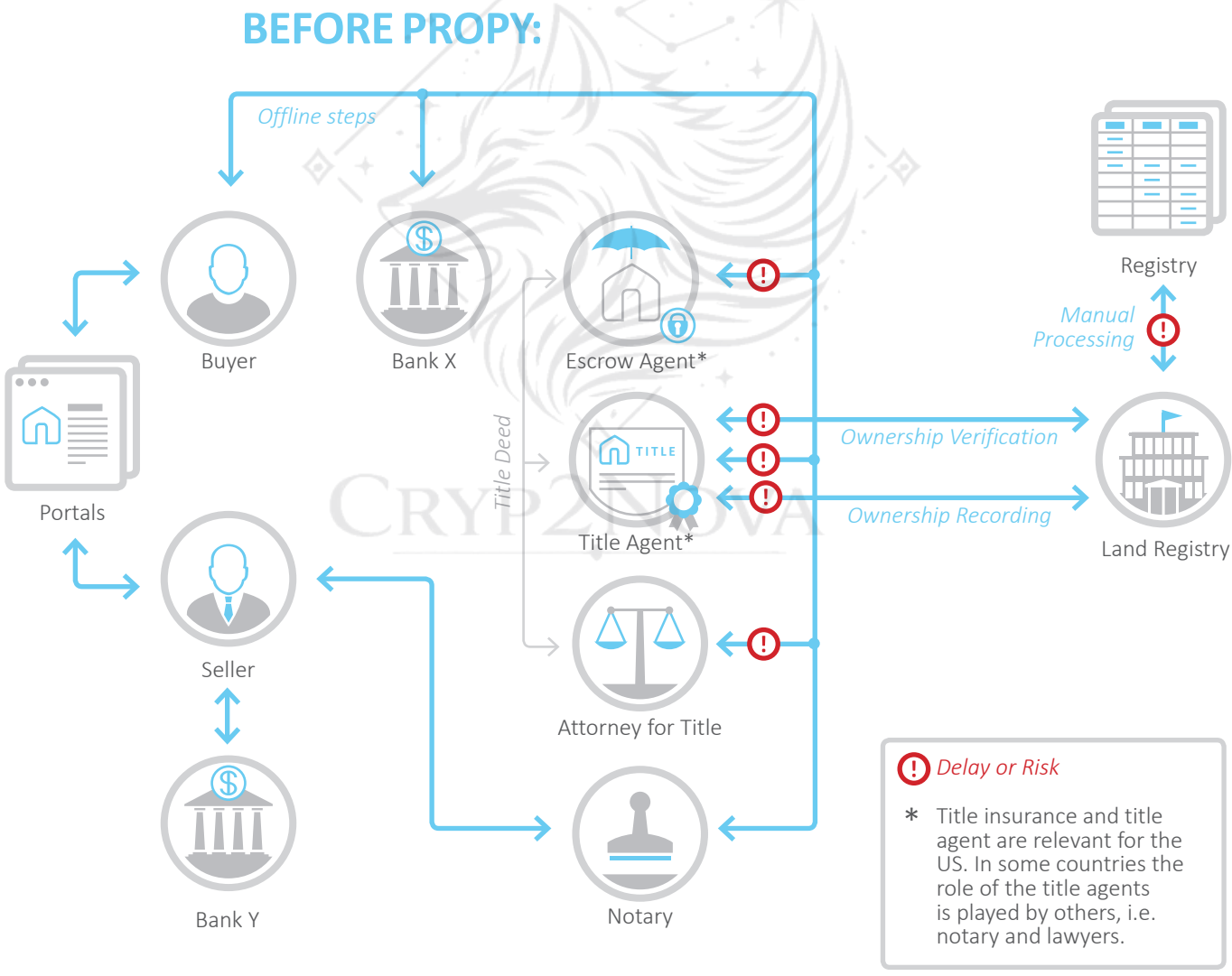


FIGURE 2. Legacy title transfer.

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2. PROPY PLATFORM V.1

Propy consists of multiple software components, as further described below.

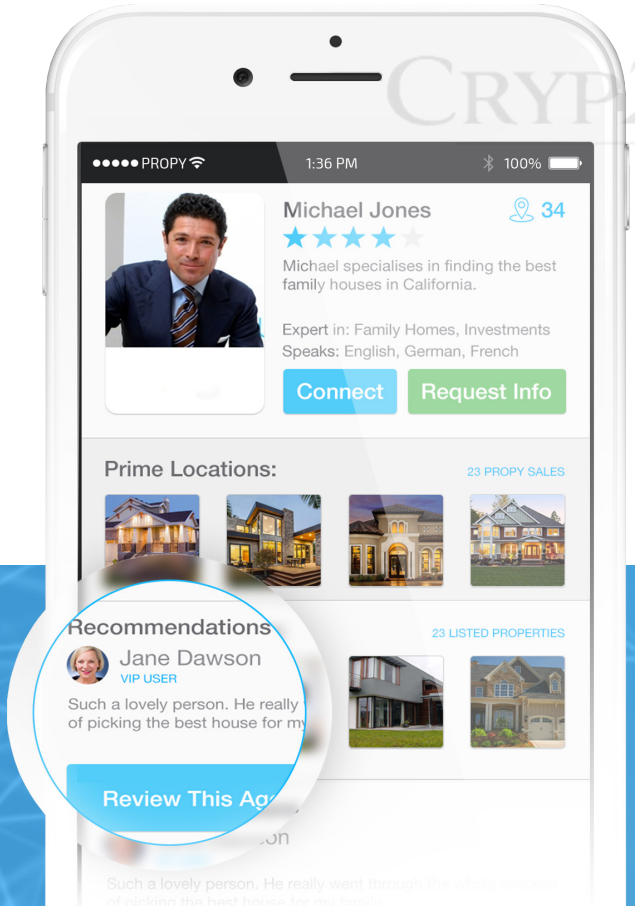
2.1 PROPY - ONLINE PROPERTY STORE

Propy is an online global real estate store, allowing buyers, sellers, brokers, and escrow/title agents/notaries to come together through the utilization of a suite of smart contracts to facilitate transactions. Propy provides a network for these actors to connect with each other and conduct real estate purchases online.

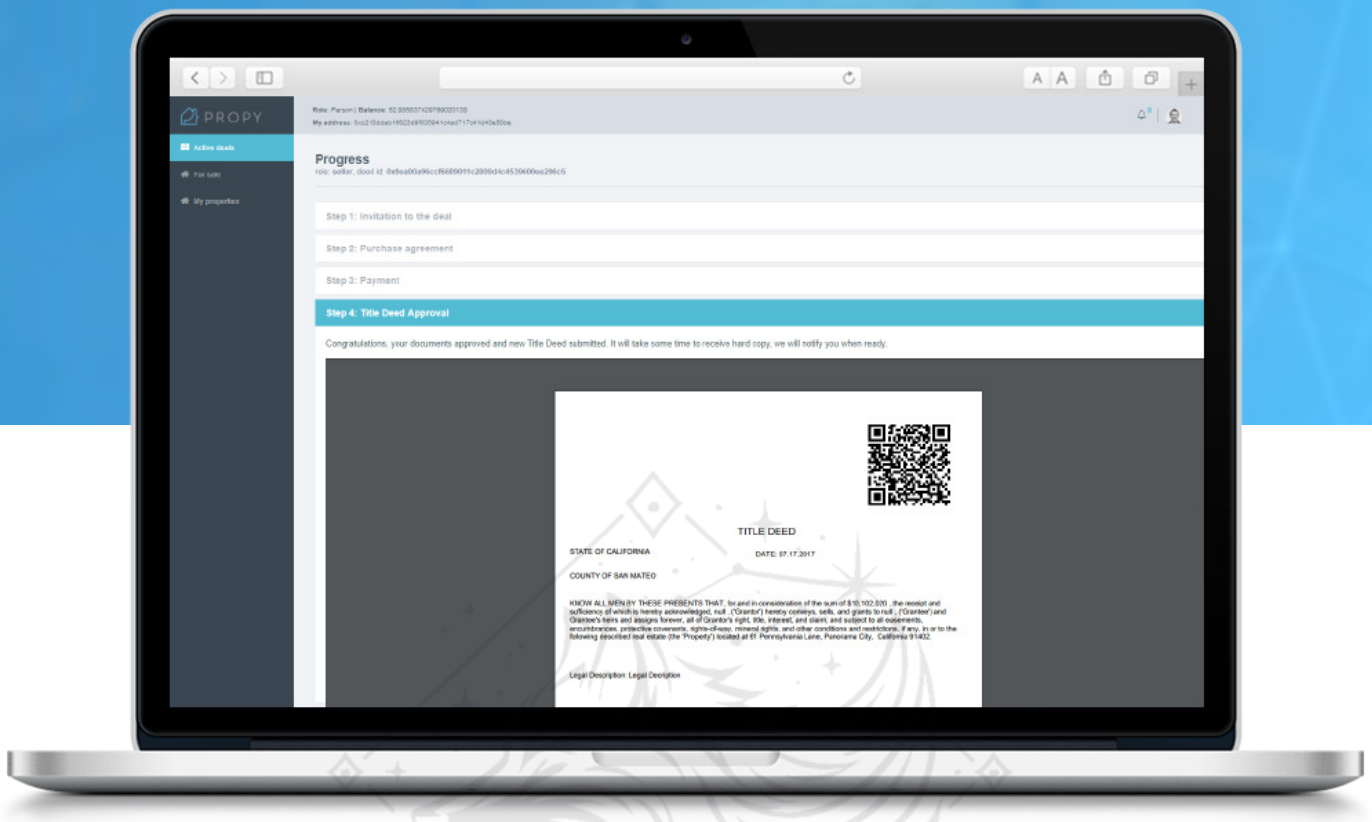
The culmination of the transaction is a digital transfer of ownership on the Propy Registry. For more information about these processes and smart contracts, please refer to section 3.

As of the date of this paper, the Propy DApp has been developed to allow users to find properties and initiate the purchase process. The current system consists of the following features and primary functions:

- Web-based platform Propy & iOS App Propy;
- Messenger;
- Localization in site and application is available in Chinese, Russian, and Arabic;
- Brokers' activity (check-ins, reviews);
- Module for data aggregation and standardization of property listings. Currently works with eight types of data feeds;
- Off-market subscription providing access to locked property listings;
- Neighbourhood data: air-pollution, walk score, schools; and
- Reservation fee payment.



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The existing product uses the following technology:

A. **Server:** C# with .NET Web API Service, MongoDB Database with two replica sets, OAuth authentication, all services hosted on Microsoft Azure;
B. **iOS Application Client:** ObjectiveC, supports all phones with minimum version of iOS8- https://itunes.apple/us/app/propy-buy-rent-properties/id1017369540?mt=8;
C. **Website, www.propy.com:** ASP.NET 4, MVC 5, React.js; and
D. **Web-based Transaction Platform prototype:** open Ethereum-based blockchain, Java, web3, truffle.

In the future, Propy intends to use a distributed database to store listings as an intermediate step along the way to a decentralized solution. The mobile app and the desktop application would have a digital wallet to store Propy Utility Tokens (PROs) and users would be able to store in those wallets the PROs that they collect via the rewards programs that are further described in Section 5 below.

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2.2 PROPY REGISTRY - GLOBAL TITLE REGISTRY

Each property has a unique title that serves as evidence of ownership. The ownership of properties is usually tracked by the recordation of such titles in organized property registries which are managed by regional governmental organizations. As previously discussed, Propy aims to develop the Propy Registry with the ultimate goal of becoming a global registry for title deed ownership information, which would be made available to worldwide entities, similar to a DNS[8] system for website domains.

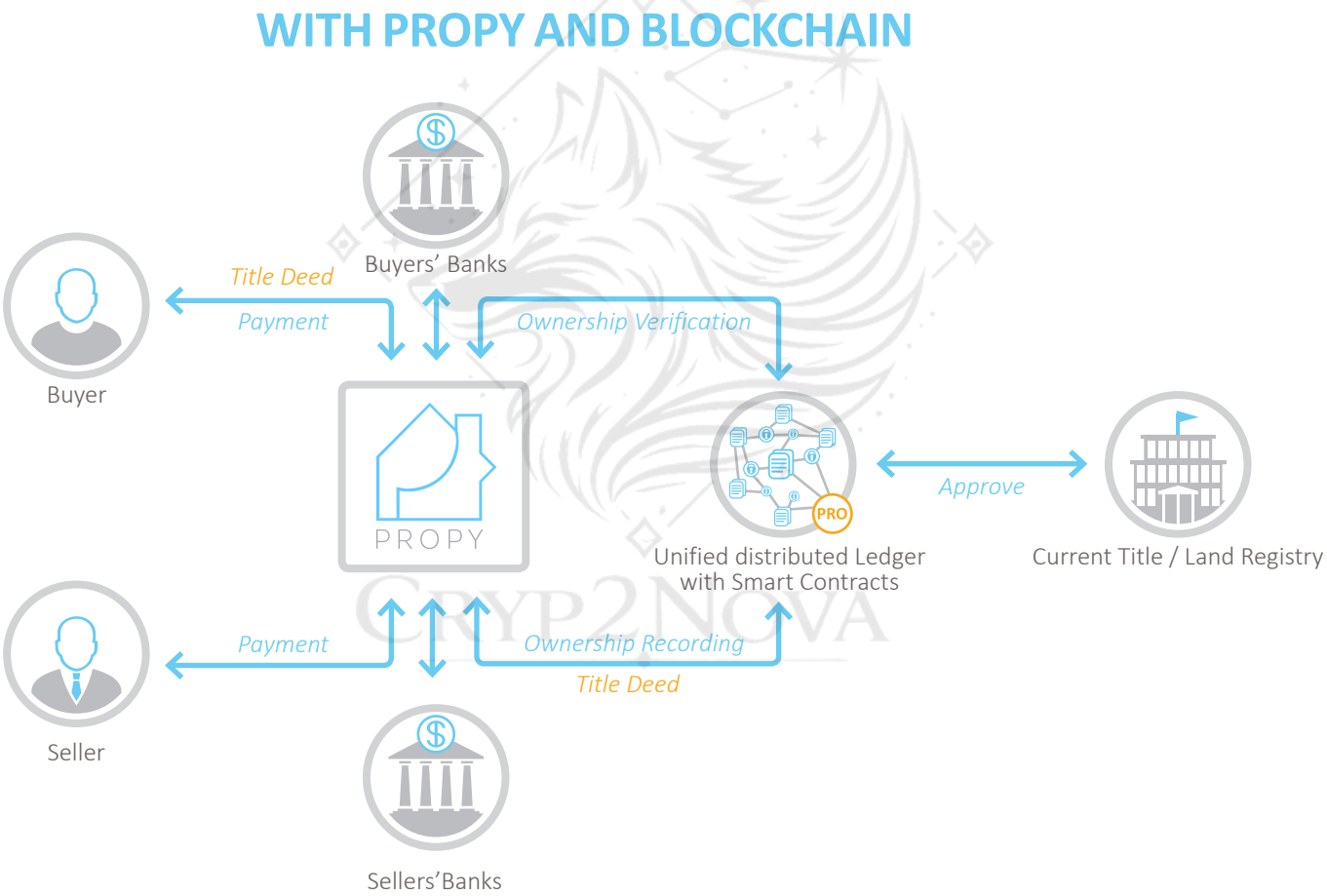


FIGURE 3. Interaction of transaction participants via the blockchain, described in further detail in Section 2.4

[8] Domain Name Servers (DNS) are the Internet's equivalent of a phone book. They maintain a directory of domain names and translate them to Internet Protocol (IP) addresses.

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As the Propy Registry evolves into a system that enables buyers to validate real estate transactions legally, Propy intends to include a modular system to allow regional governments to provide country-specific rules and regulations related to real estate transactions that would be incorporated into the Propy's smart contracts platform. The set of smart contracts developed to date are able to assist executing a real estate purchase within the current market and legal infrastructure in California, i.e. in compliance with rules and policies of escrow and title companies and in compliance with the California laws governing the recording and purchase process rules.

2.2.1 PROPY REGISTRY SMART CONTRACTS ARCHITECTURE

Propy Registry consists of multiple contracts interacting with each other, and follows a microservices architecture approach[9]. Each contract is responsible for a single type of record in the system. Each contract contains functions that allow the creation and modification of records, contract updates and other administrative functions.

The list of contracts that have been developed to date and a brief description of their functions are listed below:

A. Title Contract:

a. Responsible for storing and updating property metadata on the blockchain; and
b. The PROs are used to unlock the services within the Propy platform that would permit creating and updating property records.

B. Deed Contract:

a. Manages relevant information for Escrow services;
b. Tracks and initiates the invitation of participants in the transaction (i.e. title agent); and
c. Requires PROs to create and update deed related records.

[9] Microservice architecture is a method of developing software applications as a suite of independently deployable, small, modular services in which each service runs a unique process and communicates through a well-defined, lightweight mechanism to serve a business goal.

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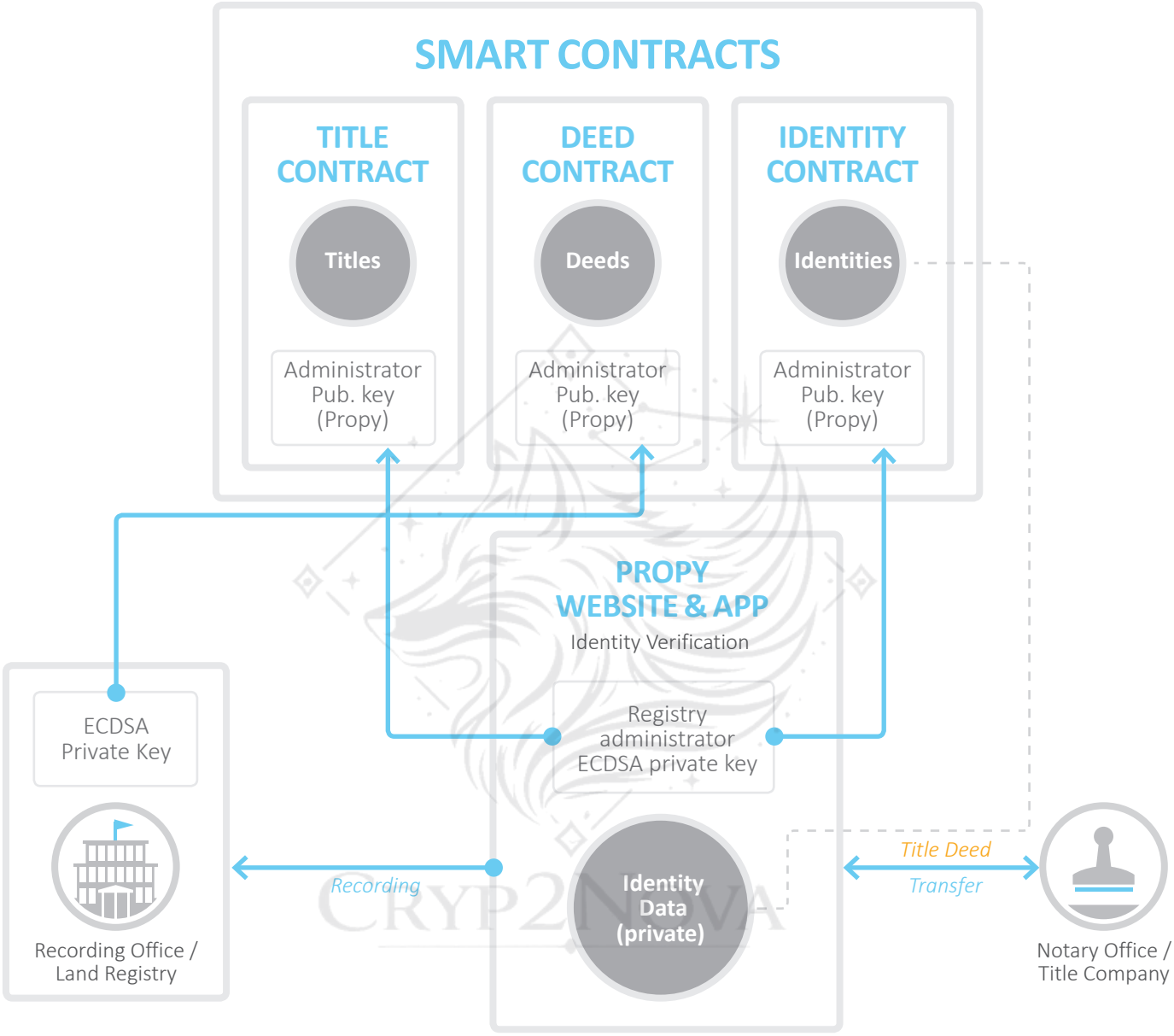


FIGURE 4. Interaction between the Propy smart contracts and the real world data.

C. Identity Contract:

a. Stores multiple records with identity information for all users of the system; and
b. Contains KYC features for verifying legal identity.

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The list of contracts which are currently under development and a brief description of their functions are listed below:

A. Agreements Contract:

a. Stores instances of various legal agreements (purchase agreements, inspection reports, disclaimers), that need to be digitally signed for Deed transactions.

B. Electronic Signatures Contract:

a. Stores digital signatures for all documents, participating in the Propy Registry;

b. Allows to having multiple signatories acting in different capacities in the same document; and

c. Validates digital signature's format.

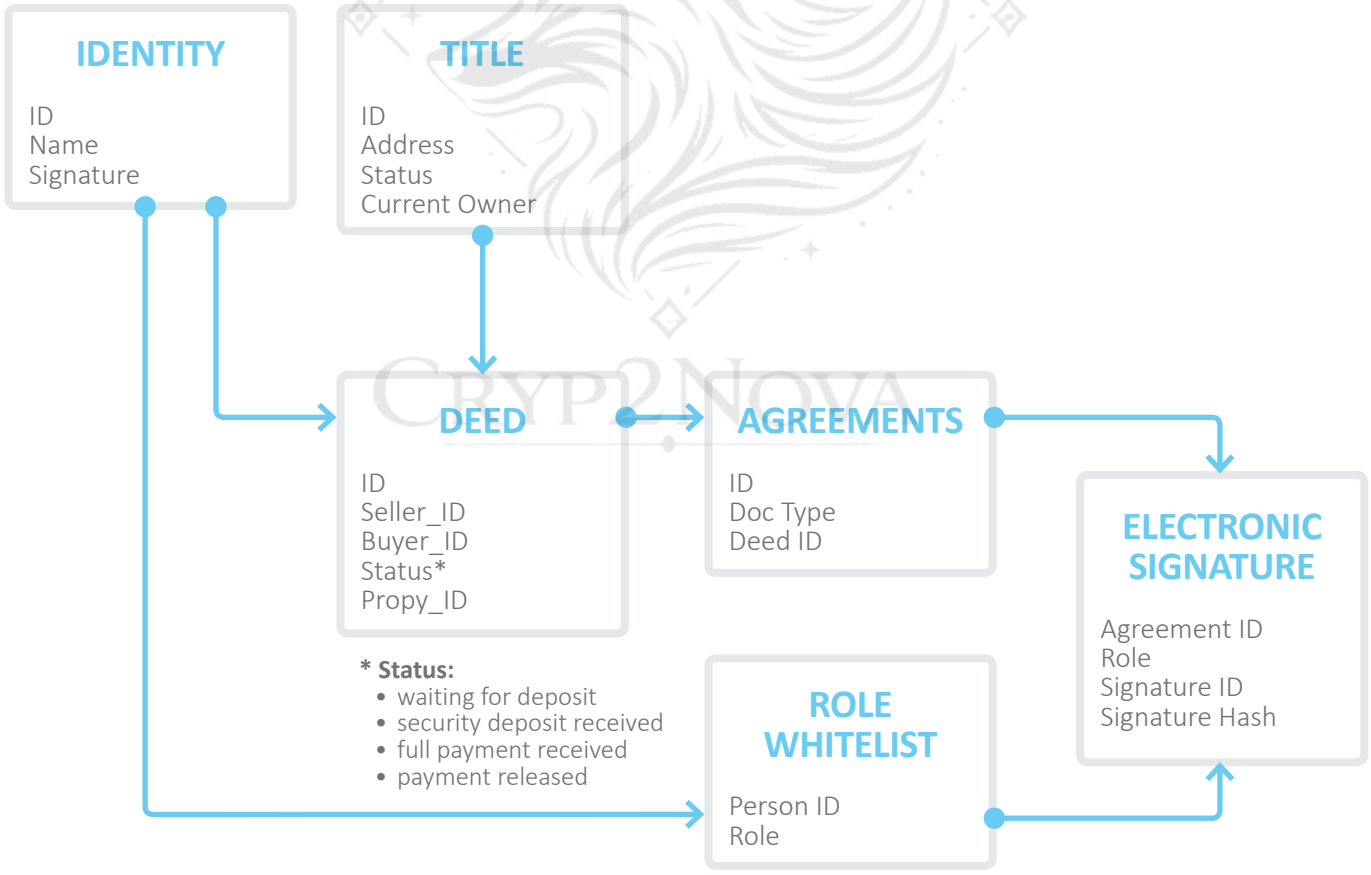


FIGURE 5.
Smart contracts architecture.

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C. Payments Contract:

a. Manages the initiation of payment requests.
b. Tracks status of payment requests.
c. Confirms authenticity of payments using variations of SPV algorithm (Simplified Payment Verification). Specific implementations will vary depending on each payment processor.

D. Escrow Contracts:

a. Contains Escrow/Title Agent functionality (adding data about the escrow account number, title transfer signing).
b. Allows a verified Escrow Agent to lock and release payments.
c. Individual Parties Contracts: related to a particular real person. Contains KYC features.

The fig. 5 diagram visualizes the information, roles and interaction between each of the smart contracts, described above.

The following participants are involved in different capacities in the smart contracts:

1. Seller
2. Buyer
3. Broker
4. Escrow/Title Agent (or Notary)
5. Recording Office (or Title Registry)
6. Money Transmitter
7. Real Estate Inspector

2.3 COMPLEMENTARY SOFTWARE COMPONENTS

Propy will seek to develop a number of complementary software components for the Propy Registry to accelerate the growth of the network.

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2.3.1 PROPY EXPLORER

The contract explorer, Propy Explorer, is an open and extensible front end which acts as a gateway for accessing information about properties and transactions in the Propy Registry, as well as Propy Utility Tokens. For more details about Propy Utility Tokens, please see section 5.

Propy Explorer intends to provide a sleek interface, within which users can search within the Propy Registry. Propy Explorer receives data from two locations: Propy's central database, and Propy Registry. Propy Registry only handles real estate title ownership, while more sizeable data, such as images, property description, purchase agreement content, come from Propy's central database (storage may be decentralized in the future). Users view transactions within those databases through Propy Explorer.

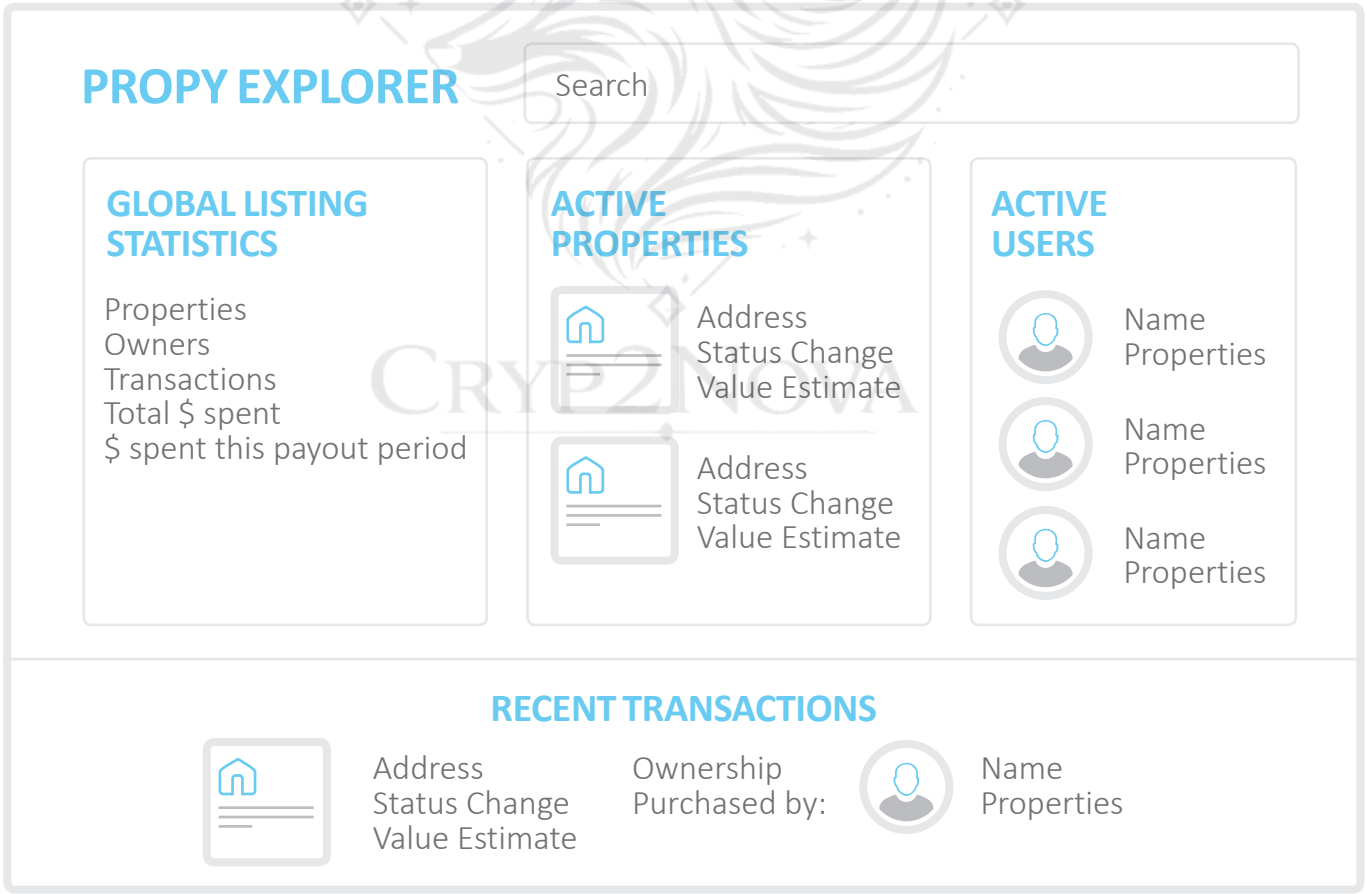


FIGURE 6. Propy Explorer UI Mockup.

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2.3.2 API LIBRARIES

Propy is developing API libraries to enable easy access to registry data for third-party applications. The libraries interact directly with the smart contracts and do not rely on the availability of the Propy website or other centralized components.

2.3.3 DATA STANDARDS

Propy plans to develop standards for storing real estate title deeds on the blockchain, which would consist of a set of metadata such as the address, owner details, right typology, property typology, coordinates, property condition. The Propy team has extensive experience and in-depth knowledge of the real estate market in the U.S., European countries, the Middle East and China. That experience is intended to help build universal data standards, constructed from the metadata enumerated above, that can be adopted globally.

Propy standards and developer's APIs are intended to empower an entire ecosystem of real estate applications.

Propy has undertaken the challenging mission of developing industry-accepted data standards for real estate transactions, being cognizant of the present obstacles associated with interoperable data and metadata that have been growing in industries such as for example geospatial technologies (Open Geospatial Consortium), electronics (Sematech), medical devices, and other activities.

Typically, interoperability standards definitions proceed most successfully through a strategic mixture of:

A. Mapping the ecosystem of stakeholders who generate, use, analyze and repurpose the data;
B. Designing a prototype platform demonstrating the economic and technical costs, risks and inability to reuse or trust data exchanged in its pre-standardized form;
C. Identifying early adopters and innovative thinkers across the ecosystem for whom the costs and risks are a burden, and

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to whom or by whom innovative uses of standardized data would be of benefit;

D. Mapping the transactional flow of data, in a typical use case, in order to see how the data is already defined as standardized by specific processes as "trusted in use";
E. Extracting the trustworthy data definitions, and creating a concordance (often via APIs) in order to tag trusted data by the process that created or used it;
F. Developing the technical specifications for qualifying the standardized data and metadata;
G. Proposing the standard data definitions to the stakeholders who operate, use or rely on the business process; and
H. Seeking ISO or other international standards setting organizational approval of the standards so that ISO-compliant software, hardware and services can expand the supply, demand and utility of standardized interoperable data.

2.4 TRANSACTION PLATFORM V.1. PROTOTYPE WORKFLOW

Below is a description of the main flow of activities expected to occur in the Propy platform as currently envisioned for a real estate purchase in California:

1. Buyer finds a property for sale in the Propy DApp.
2. Buyer provides a flat reservation fee (approximately $5,000) to ensure that he or she has a legitimate interest in purchasing a property. Broker sends the notification to seller about the offer submitted by buyer and invites the seller to get registered in Propy to close the deal. Seller accepts the deposit, and thus the offer. Buyer and Seller both provide KYC/AML documentation. The KYC process is outsourced to a third party provider such as Civic.
3. Purchase and Sale agreement is generated by Propy and sent to the parties.
    a. The Title Contract establishes the parameters of the transaction in order to comply with applicable regional regulations.
4. Propy performs ownership verification at Propy Registry via Escrow/ Title agent participation at Propy's system.

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5. Buyer receives notification that ownership has been verified and signs the agreement electronically.
6. If the price proposed by the buyer is accepted by the seller, she will proceed to electronically execute the agreement.
7. If the buyer in connection with the property purchase opted to perform a property inspection (and appraisal), then within seven days, Propy would provide, at an additional cost, an inspection report prepared by a third-party service provider.
8. Money is transferred to an escrow account, set by an Escrow/Title Agent at the dashboard in Propy DApp, either in one transfer or X% deposit and Y% in installments. Fiat currency will be used.
9. Propy generates the payment form for Buyer and tracks the payment with its payment processor partner(s).
10. Propy marks payment as received on Payment Smart Contract Status once the wire transfer arrives as per notification by the payment processor partner(s).
11. Propy verifies again the ownership at the Propy Registry ledger and via third parties such as title company and records the asset transfer on the Propy Registry in “Pending” mode, notifies the Recording Office and sends the blockchain hash to the recording office and to all the other parties involved.
12. Prepare property for the transaction.
    a. Propy notifies Seller and Buyer that the funds have been received and ownership is clean and “Pending.”
13. Sign electronic Transfer of Title Deed with Escrow/Title Agent.
    a. Propy generates Title form for Buyer and Seller to sign.
    b. Seller accepts and signs a Title Transfer contract at the Escrow/ Title Agent’s Office (or E-notary in the future).
    c. Buyer accepts and signs the Title Transfer contract/
    d. E-notary verification takes place or Title Agent signs the deed. Transferring property ownership.
14. Escrow Agent submits the sale closing documents to recording office.
    a. Recording office changes ownership records.
    b. Propy issues own electronic title deed with blockchain hash and QR code to the buyer (All the documents collected during the transaction besides the title deed are enforceable. We believe this will be a catalyst for the Propy title deed to become enforceable as well).

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c. Recording Office issues the physical Title Deed via mail to the Buyer.
d. Escrow Agent distributes money to Seller, Brokers and itself and via the dashboard at Propy notifies about the completion of this step.

15. Deed Smart contract after the notification from step 11 marks the transaction as "Completed" on the Propy Registry (shows transaction ID here).

Post conditions: Property's ownership is changed from Seller to Buyer in Propy Registry.

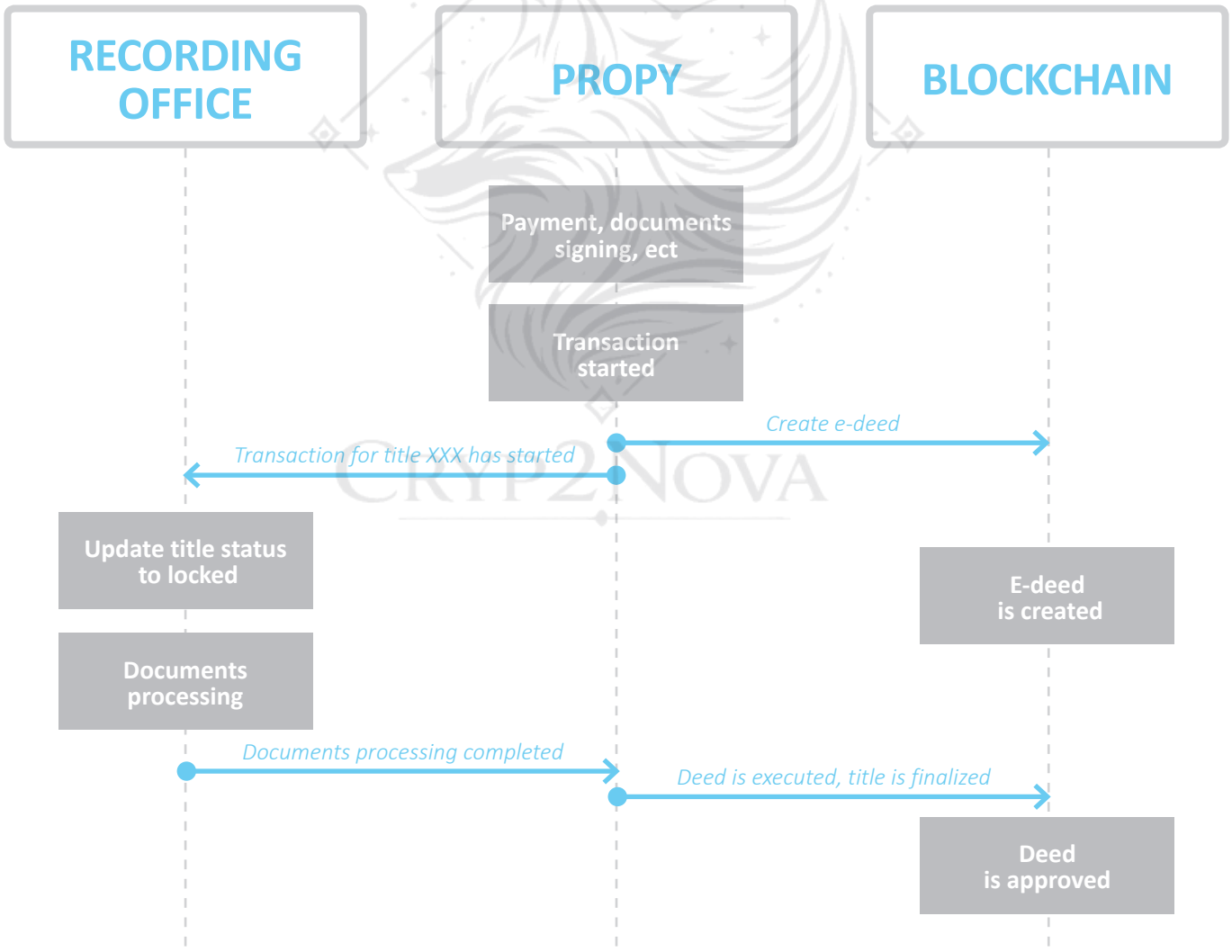


FIGURE 7. Propy title issuance and recording within the existing ecosystem.

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3. PROPY PLATFORM V.2 FOR DECENTRALIZED P2P SALES

3.1 OVERVIEW

The following description of technology and processes represents Propy's goals for the future and is subject to change based on regulatory and market requirements.

As mentioned previously, the ultimate vision of Propy is not merely to operate within the existing real estate legal infrastructure, but to disrupt the legacy system by providing a far superior solution. The Propy team has developed an idea for advanced real estate transaction services, provided that the legal environment catches up with this disruptive new blockchain technology. The Propy Registry, Property Store and other services will achieve its full promise if and when land registries are modernized to support this technology and recognize the Propy Registry as effectuating a binding and legally enforceable change in title. Among the things that need to happen to make this possible are:

1. Digital signature in public blockchain need to be recognized as legally binding.
2. An identity system needs to be adopted, it would associate individuals with a specific blockchain address (eID cards with biometry is one of the options).
3. Each government agency, participating in real estate transaction, should have a smart contract-based API (especially crucial for entities in charge of property taxes estimation and collection).
4. All records from real estate land registries should migrate to the blockchain.

3.2 SMART CONTRACTS PARTICIPANTS

Below is a list of the participants that need to be involved in the smart contracts:

1. Seller
2. Buyer
3. Notary or E-Notary or Government Validator
4. Broker (optional)
5. Real Estate Inspector (optional)

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3.3 WORKFLOW

The workflow below gives a high level overview of how a P2P real estate transaction would work:

1. Seller lists a property in the Propy DApp.
2. Buyer finds a property in Propy DApp that matches his criteria.
3. Buyer submits an offer via smart contract to the registry subject to minimum legally compliant conditions (including specifying whether to include an inspection report).
4. Seller accepts an offer by signing it with their digital signature.
5. Intermediaries perform their actions (inspection and other requirements of the smart contract, provided by the buyer).
6. Once the conditions mentioned above are met a smart contract triggers the payment system for Buyer to pay in cryptocurrency (any currency can be supported).
7. Smart contract accepts the payment and transfer the ownership to the new owner on the Propy Registry once all terms and conditions are met.

As mentioned in (3), we are making the system modular and letting Buyers provide a number of conditions and inspection requirements. In such a circumstance, the third party involved in satisfying the conditions signs the smart contract with a digital signature.

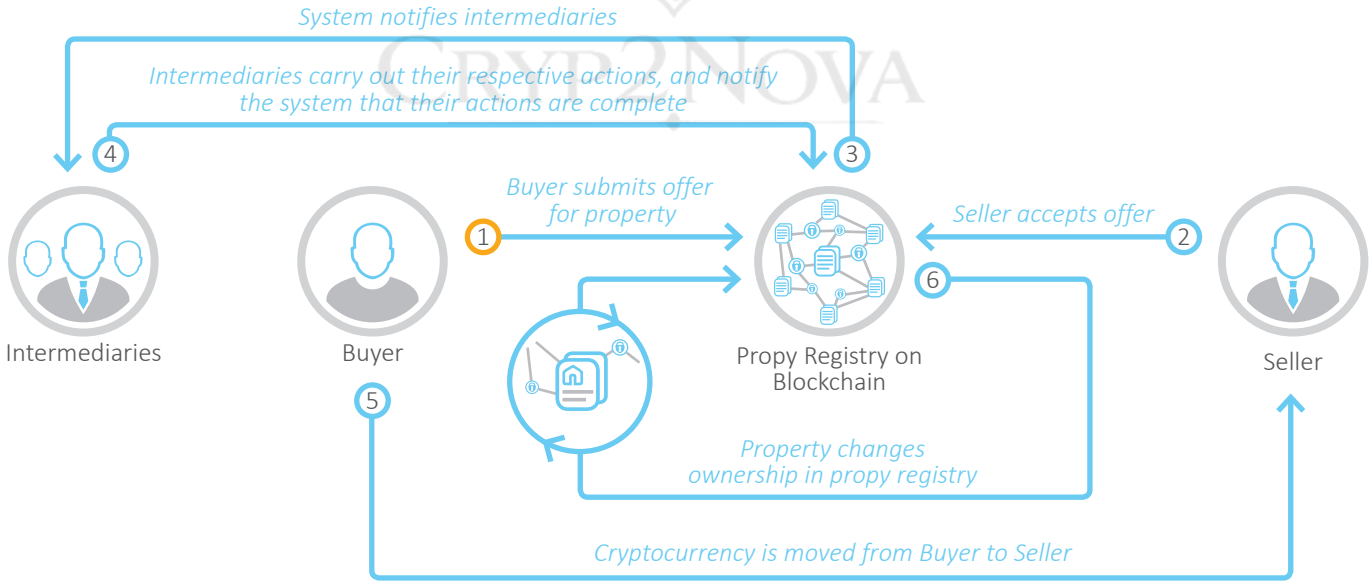


Figure 7. P2P Transactions in the Propy DApp

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4. BUSINESS MODEL

Propy has a very simple and scalable business model. When a property is purchased on the Propy network, Propy takes a small percentage of the final purchase price. Propy charges real estate brokers per transaction for using Propy's technology and tools. Payment will initially be made in fiat currencies, and cryptocurrencies are plan to be added over time in the jurisdictions where it is possible to do so. With a $340bn market size of all cross-border real estate acquisitions and dispositions trading annually[10], the addressable market for Propy is significant.

The percentage that Propy takes from the final purchase price can be smaller than the one currently charged by the existing intermediaries in the real estate disposition process. Future expansions of the Propy.com platform plan to eliminate multiple intermediaries, which would progressively decrease transaction cost over time.

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[10] "Cross-border capital flows to thrive as world grows older", JLL, 2016.

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5. PROPY TOKEN (PRO)

5.1 INTRODUCTION

The PRO tokens are designed to be used to unlock a smart contract for title transfer in the Propy Registry. PRO tokens are built on the ERC-20 token standard, which allows for simple integration into users' wallets. The essential and obligatory steps for a real estate acquisition on Propy Registry includes the execution of the Deed Contract and Title Contract, which are necessary for the transfer of property title and the recording of the change of ownership. The Propy Registry, will require the use of PROs to pay the associated "Registry Fees" to record these modification on blockchain.

Using PROs in the Propy platform is intended to be simple and user friendly. Users would initiate the writing of new data to the Propy registry via Propy's interface, whether that data would result in the creation of new title, or transferring a title already recorded in the system.

As such, the use of PROs will be necessary to access the services provided in the Propy platform, as it would act as:

- A uniform method of settlement for interacting with Propy Registry, which reduces time delays and independence from any particular fiat currency.
- A decentralized registry requires some barrier to entry to initiate transactions, otherwise the Propy network would be overloaded with unnecessary records. The usage of PROs is crucial for the network in order to prevent spam. If requests to write new information to the network were free, attackers could repeatedly send faulty requests; this 'blockchain bloat' would prevent genuine requests from reaching validators in the network.

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5.2 REGISTRY FEES

As defined in section 2.2.1, the following contracts will require fee payment:

- **Title contract** — for all operations, that require creation and updates of title records.
- **Deed contract** — for all operations, associated with creation and updates of deeds.

The company will develop a method to insure that the Registry fees remain within a reasonable range relative to comparable services priced in fiat.

5.3 TOKEN FLOW OVERVIEW

The specific flow of PROs would be slightly different for users who already own PROs than for those who do not at the time of the property purchase. The users who do not own PROs have to buy them in the third party marketplaces in order to transact.

Below is a description of the basic flow of PROs:

1. Once a Buyer has selected a property to buy, it will initiate the transaction via the Propy website/application.
2. As Buyer goes through the KYC process, an identity record will be created in Identity contract.
3. Buyer would then make a Reservation fee payment in fiat and pay the Registry Fees in PROs (see section 5.2).
4. Records in the Deed and Title Contracts are intended to be unlocked and executed as the purchase process occurs.
5. The collected PROs are intended to be distributed as per section 5.5.

5.4 ECONOMIC MODEL

The PROs have a fixed supply of 100 million. The entire supply of tokens will be issued at the beginning of the token sale. New tokens cannot be created and the existing ones cannot be destroyed. Therefore, as demand rises, there is no corollary increase in supply.

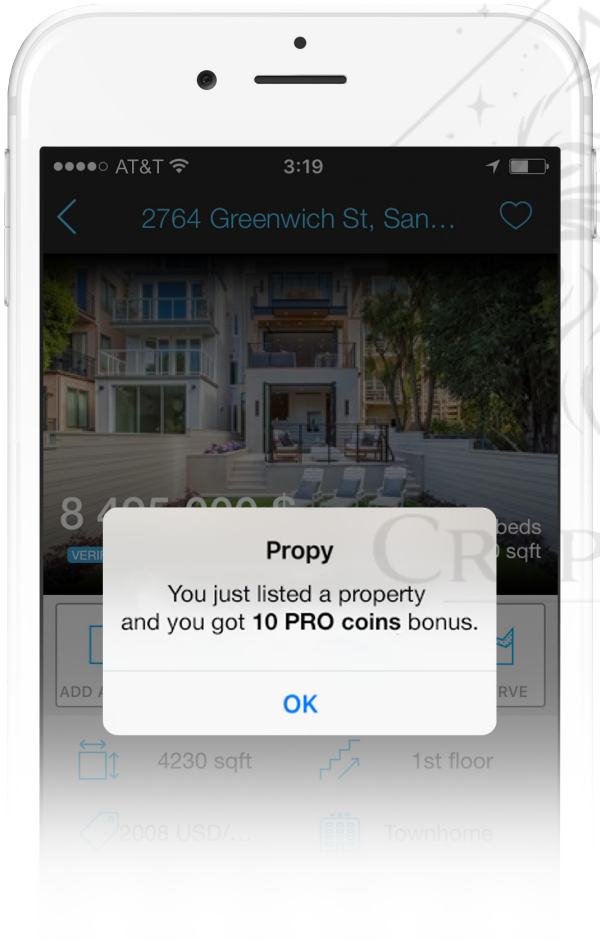
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The PRO will be necessary to utilize the Propy Registry regardless of whether it is accessed through the utilization of Propy services or a third party interface.

5.5 PROPY REGISTRY FEE USAGE

The PROs paid for the Registry Fees would be distributed as follows: 1/3 would be distributed to the company and 2/3 would be added to the Network Growth Pool (as defined in section 5.6).

5.6 NETWORK GROWTH



Initially, 35% of the total supply of PROs would be reserved for network growth. Additionally, the network growth pool will receive ⅔ of PROs collected from all the transactions as described in section 5.5. The network growth pool of PROs would be used to incentivize the engagement of users in the platform.

Propy users would receive rewards in PROs when undertaking certain actions on the platform. For example, when a broker, home buyer, or home seller joins the platform, they would receive a reward in PROs for doing so. This reward system intends to encourage the adoption of the Propy platform worldwide. As more users join the platform, there could be an associated increase in the number of real estate transactions performed on the platform.

Propy also intends to make distributions of PROs from the network growth development pool to governments and other large institutional actors to incentivize the utilization of the platform. Propy expects that this would accelerate the realization of Propy's vision —

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the acceptance of the Propy Registry as a universal, decentralized legal ledger for real estate ownership.

5.7 DONATIONS

Propy is aware that blockchain technology is not yet mature enough to handle the load implied by millions of users, or billions of transactions.

While current network performance and infrastructure is predicted to be sufficient for the future expansion and utilization of the Propy Registry, Propy recognizes the importance of continued protocol-level development to help achieve the ubiquitous usage of blockchain technology and to support the load implied by millions of users and billions of transactions.

In pursuit of our vision, we are reserving 15% of the total supply of PROs for donations to different organizations within the blockchain ecosystem to support the improvement of blockchain infrastructure so that it can also meet the transactional requirements of Propy and the Propy Registry at scale. As part of this effort, Propy plans to donate to the foundations such as Ethereum Foundation to support their research and development towards scalability. Additionally, Propy plans to make donations to support educational efforts in blockchain. Propy also intends to support hackathons, Solidity educational programs, and blockchain courses.

The Donation Tokens will be distributed to foundations selected by the company within three months after the crowdsale end date, on the condition that the Donation Tokens will be locked for twelve months after the crowdsale end date. After they are unlocked, the Donation Tokens can be used by the foundations as follows:

A. Support of development of blockchain and widespread integration.
B. Support of research towards blockchain scalability and identity.
C. Support of education efforts in blockchain technology.

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5.8 COMPANY

15%, or 15 million of the total supply of PROs is intended to be reserved for the company unders following conditions:

- 2 million Development Tokens will be immediately available for use by the company;
- 5 million Development Tokens will be locked for 12 months from the Crowdsale End Date;
- 5 million Development Tokens will be locked for 24 months from the Crowdsale End Date;
- 3 million Development Tokens will be locked for 36 months after the Crowdsale End Date.

Once unlocked, the company reserves the right to use the Development Tokens for any purposes at its sole discretion. If Company elects to sell any of the Development Tokens, the Company will sell such Tokens for a price no less than the Price Per Token, and the company may elect to provide Bonus Tokens to the purchasers of such Tokens, but the bonus rate will not exceed 10%.

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6. CONCLUSION

Propy's vision is to ultimately enable a global real estate market with a unified real-time purchase interface and a decentralized title registry. It is being designed to allow real estate assets to become more liquid while providing users with greater control over the transaction process. To achieve that goal, Propy intends to further the development of a new ecosystem of token holders, brokers, governments and end users incentivized to support the transition to a seamless, secure, and globally recognized real estate transaction network.

Propy expects that if it succeeds in carrying out its vision the following will occur:

- It is anticipated that brokers and real estate corporations will progressively start using the Propy platform to access foreign buyers in an easier way and to be able close transactions nearly instantly and securely online.
- Governmental entities, notaries and title companies need a system to transfer data among each other and combat fraud and, in some cases, corruption in global real estate markets. Propy proposes that governments could use the Propy platform to improve the transparency of local real estate markets and therefore improved attractiveness for foreign investors.
- Finally, most importantly, the consumers — buyers and sellers — will be able to buy and sell real estate assets faster, cheaper, and more securely.

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