KNOTEL KOIN

REVOLUTIONIZING THE COMMERCIAL
REAL ESTATE INDUSTRY

POWERED BY:
KNOTEL

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ABSTRACT

Knotel is building an ecosystem to facilitate on-demand, secure and low-cost access to commercial real estate listings via the blockchain. Landlord and tenant office space listings will be more accessible, increasing listing validity and accessibility while reducing cost and enabling an ecosystem to innovate on product offerings on top of the core blockchain-stored data. Knotel intends to introduce a KnotelKoin, a token that participants in the ecosystem will use to transact in listing related services. This ecosystem will reduce the overall costs of interacting within the commercial real estate market by removing inefficiencies, enhancing security, and improving data accuracy.

OVERVIEW

Knotel is changing the way commercial property is listed, leased and recorded by creating a blockchain-based record of available commercial space, tenants seeking that space and, ultimately, all related real estate transactions.

Currently, the publicly available data pertaining to the commercial real estate market is controlled by a handful of proprietary platforms, such as CoStar[1], which alone collects close to $1bn in annual service fees allowing brokers and property owners to locate available space. There are also other tenant-facing platforms, like 42Floors[2], which target potential lessees. Unfortunately, in both instances, the data is controlled by a central party. The public is therefore unable to verify the information they find online. Property histories are either not transparent or unavailable, so consumers are unable to understand how the listing has changed over time. Altogether, the current system creates a fragmented market where controllers lack any incentive to share their data with the public and/or technological resources to produce a clean dataset or innovate on offerings. Without access to verified and up-to-date information, tenants and landlords alike need to contract intermediaries (e.g., agents and brokers) to lease and rent commercial space, thereby inflating the cost of finding office space and reducing flexibility. This is analogous to other industries, like travel agencies, e-commerce, and the music industry, which have been disrupted altogether with the advent of modern technology.[3]

For centuries, the commercial real estate space has been controlled by property owners —in the past businesses have been forced to sign ten-, fifteen-, or twenty-year leases— forcing tenants into expensive long-term deals which are unfriendly to both the tenant and the landlord because tenants become extremely value-oriented and inflexible given the commitment. Nor can the landlord benefit from rising rents. Technological acceleration has allowed and necessitated small businesses to be flexible in both location and time. Potential tenants expect the search for open office space to be easy, and it is not. Secretive data remains the norm, not the exception.

Decentralized property information has been proposed as a conduit for cost reduction and the eventual elimination of brokers before. In 2007, bestseller “Freakonomics” predicted that the internet would cause massive disruption to the real estate brokerage industry.[4]

[1] http://www.costar.com
[2] https://42floors.com/

Five years later, the authors of the book wrote an update declaring that their claims were wrong: even with the growth of information available to consumers, there were still approximately the same number of realtors in the U.S. making approximately the same amount of money.

The answer for why disruption to this market has yet to occur is simple: two-sided, highly localized, broker marketplaces retain their existence and value through relationships. Even with all the information available to tenants, completing a transaction through the seller's broker almost always requires a buyer to have a broker as well. Relationships run the commercial real estate industry more than any other factor, and nothing has changed in the last 20 years of technological development to significantly alter that. The world of technologists might not appreciate this particular sales skill and the incredible compensation that goes along with it, but it would be foolish to totally disregard the power of relationships. Even if the blockchain successfully transforms the commercial real estate data space, top brokers and landlords will continue unaffected as long as they are still getting paid based on their relationships.

In the context of commercial real estate, disruption does not necessarily entail elimination. Knotel's blockchain technology will be used to remove information-opacity and low-value-add intermediaries from commercial real estate transactions, providing more value to both renters and landlords alike.[5]

Knotel will begin creating the records by adding its own current data and that of its partners, including square footage, pricing, information about a building's history, images and more. This will jumpstart the network due to the company's properties in several key markets, including New York City, San Francisco, London, and other international marketplaces.

To encourage rapid growth, Knotel will incentivize other parties to post and update real estate data on the blockchain. Knotel will do this by having its protocol work with other blockchain-based applications to verify third parties' data validation, thereby allowing almost anyone to post information in the database. The Knotel Protocol will be able ensure that all data posted on the blockchain will be accurate, historic, high-quality information that can help renters and landlords alike make better decisions while eliminating low-quality and false information. What's more, third parties will be further incentivized to help create the network and become part of the ecosystem by receiving

[4] Levitt, S. D., & Dubner, S. J. (2005). Freakonomics: A rogue economist explores the hidden side of everything. New York: William Morrow.

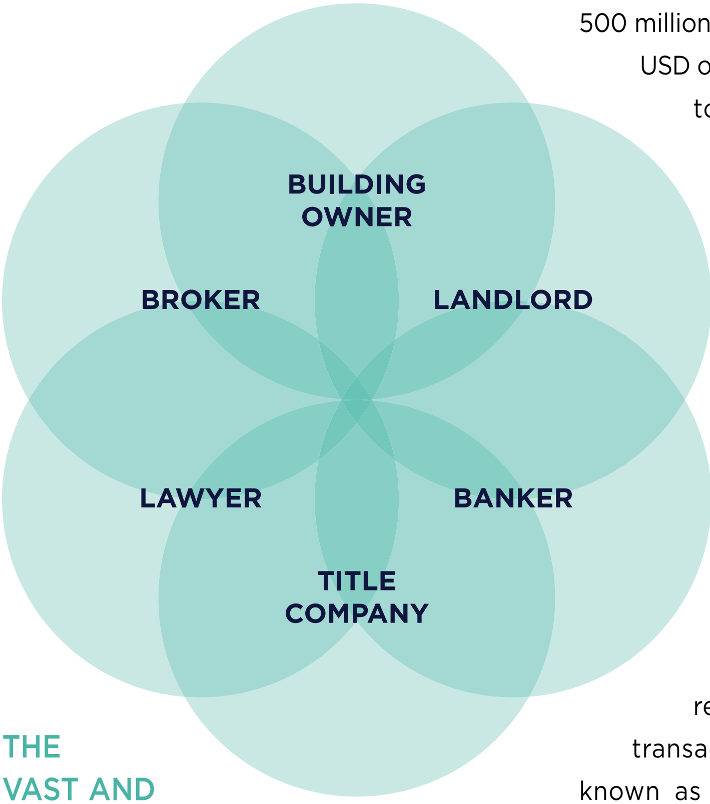
[5] https://www.theglobeandmail.com/report-on-business/industry-news/property-report/blockchain-technology-threatens-the-middleman-in-real-estate-transactions/article37605792/

payments for their participation in KnotelKoins, a utility token with a fixed supply that will be used to process transactions across the network. This structure incentivizes early marketplace participants because they can receive upside as the value of the marketplace grows, through an increase in the price of tokens.

As the network continues to grow and more and more people participate, the real estate listing platform will become increasingly comprehensive. Over time, this will ultimately vastly improve the available commercial real estate data, facilitating better decision making and decreasing the need for low-value-add intermediaries throughout the industry[6], enabling tenants and landlords alike. Instead, they will be able to move forward with the confidence that comes with knowing that transactions are secured and that they will only be validated when predetermined parameters, to which they agreed, are met. The end result will be a significantly more efficient commercial real estate ecosystem that provides more value and agility to all parties.

Knotel's blockchain network will ultimately provide the best data set in the commercial real estate market, on a global scale. After developing a more efficient listing platform Knotel plans to utilize other more complex functions of the blockchain to continue to revolutionize the commercial real estate industry.

PROBLEM



THE VAST AND UNCHANGING MARKET

The office market has been less receptive to the forces of change so far, a fact certainly causally related to its largesse. For reference, real estate around the world is a 217 trillion USD market with 29 trillion USD alone marking the commercial market size.[7] Global real estate investment was at 1.39 trillion USD last year[8] alone. The New York City market is one of the world's largest. Manhattan investment sales for commercial properties were 12 billion USD[9] in 2017, with 500 million square feet and nearly 45 billion USD of annual leasing fees from tenants to owners.[10] Commercial office space listings are messy and noisy, circulated by multiple parties from owners to brokers to tenants, often without a single consensus set of critical information on size, amenities, condition, and features. Owners inflate deal costs with hopes of making their property seem more valuable.

Further, a large portion of real estate value is consumed by transactional costs on finding (also known as "search cost"), acquiring and closing on real estate transactions. Listings, leases, sales, and financial information are opaque and largely done in hard copy, phone call negotiations, electronic PDF format replicas, and in serialized workflows. Typical brokerage fees are 10% or more of deal value. Transaction times are measured in months. Lenders, insurers and owners manage large headcount organizations focused on compliance and fact-checking. The real estate industry is one of the last to still provide so much value to intermediaries, making it ripe for technical disruption.

6 https://thenextweb.com/contributors/2017/12/15/smart-contracts-blockchains-coming-sooner-think/
7 http://fortune.com/2016/01/26/rea-estate-global-economy/
8 http://www.cushmanwakefield.com/en/news/2017/04/investment-atlas-2017/
9 http://www2.colliers.com/en/News/New-York/The-New-York-office-market-as-of-Third-Quarter-2017
10 https://www.washingtonpost.com/realestate/realtors-issue-a-blunt-assessment-of-problems-facing-their-business/2015/06/09/7c27dbe6-0deb-11e5-adec-e82f8395c032_story.html?utm_term=.c116aa91f958

LISTINGS TRANSPARENCY

For more than 100 years, residential real estate agents have relied on some variation of the Multiple Listings Service (MLS) to list and manage residential properties. Brokers input MLS listings into databases that can be accessed by other realtors who have paid membership fees, which ultimately trickle down to the consumer, 6% of each sale goes to realtors as commission.[11] On the commercial side, several private operators serve as the "source of truth" for the industry.

While the early incarnations of this shared information repository were effective, the residential and commercial markets presently rely on information that is essentially crowd-sourced but without history, authentication, verification, accountability, or consensus. These repositories are governed by interested parties — in the case of commercial markets each region has multiple competing registries (e.g., Compstak, Costar, etc.). Even in cases where market participants are happy customers, the joint data platforms are designed to block market entrants and/or small players from achieving data parity.

Transparency, many believe, is the key to success in real estate.[12] In the American residential market, where lack of accurate data triggered the subprime crisis of 2008, a number of customer-facing real estate platforms have been designed to make it simpler for buyers to find the information they need without the help of realtors. In European and Asian markets, there are similarly successful players (Rightmove in England[13] , for example, and Juwai in China[14] are prominent examples). Apps like Zillow, Trulia and StreetEasy have emerged to ostensibly make it easier for prospective homebuyers to make informed decisions by making data more available and making the entire home-buying process more transparent. Unfortunately, while Zillow, Trulia, and StreetEasy might be a step in the right direction, the platforms still aren't particularly useful because they can't guarantee the accuracy of the data they present in their listings. Many if not all of the listings on these platforms are filled with incorrect or incomplete data, including:[15]

- **Inaccurate basic information about the property (square footage, etc.)**
- **Missing property tax records or mistakes in listing prices**
- **Unaccounted for upgrades and home improvements**

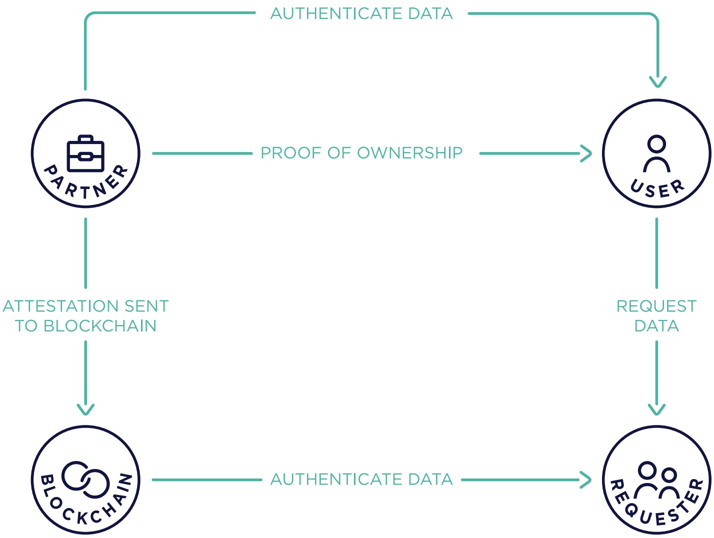
In commercial, the information gaps are even larger: consumers often lack basic information about where to even find listings. Internationally, in a number of regions, such information exists only on paper and is mainly filed with local government officials.

FINDING LEASES AND PRICING DEALS

Commercial real estate transactions between two parties continue to be completely private, peer-to-peer transactions recorded between lawyers and on paper. There is no single record of all transactions, and any efforts to catalogue them are not public, jointly-created, authoritative, or auditable. As a result, prices are opaque throughout commercial real estate markets globally. The price-visibility impact of e-commerce across markets from residential to flights to travel to shipping to the efficiencies of financial markets are not yet available. This reality has caused prospective commercial property tenants to pay inflated costs to lease space for their business. The widespread price inflation practice is doubly harsh considering how the needs of today's businesses are changing with respect to finding and renting physical locations for extended periods of time. Long-term leases require significant upfront expenses which put significant financial weight on the businesses that signed them. For example, in New York City alone, businesses collectively pay $45 billion in rent each year. And they have nearly $12 billion sitting in security deposits.[16] Further increasing costs, the process of doing a real estate transaction therefore requires a heavy financial, legal, and procedural burden. A typical deal worth $1 million includes $50,000 of legal fees to specialist lawyers who negotiate deal points one by one, turn hard copies, and close deals in ink. Moving certain aspects of leases to smart contracts stored and encrypted on a common chain will transform the process and efficiency of the commercial real estate market.

[11] https://www.washingtonpost.com/realestate/realtors-issue-a-blunt-assessment-of-problems-facing-their-business/2015/06/09/7c27dbe6-0deb-11e5-adec-e82f8395c032_story.html?utm_term=.c116aa91f958
[12] https://www.homevalueleads.com/lets-be-clear-transparency-is-key-to-real-estate-success/
[13] http://www.rightmove.co.uk/property/London.html
[14] https://list.juwai.com/
[15] https://www.investopedia.com/articles/personal-finance/111115/zillow-estimates-not-accurate-you-think.asp
[16] https://www.huffingtonpost.com/entry/the-low-tech-drag-on-high-tech-businesses-that-needs_us_5911d7b1e4b0e070cad708da

KNOTEL SOLUTION



WHAT KNOTEL HAS DONE, WHERE KNOTEL IS GOING, AND WHY KNOTEL IS BETTER

After only two years in operation, Knotel has achieved double-digit market share of commercial real estate in critical New York submarkets, and the forecasts for growth point to 50%+ market share. In 2017, Knotel was 15% of the leasing and deal activity in several of the largest submarkets in one of the world's largest real estate markets, New York. In the near term, Knotel will reach double-digit market share of deal activity in at least San Francisco, New York and London. In the next 3 years Knotel will cover the 10 largest markets in the West.

This enables Knotel to launch a platform with participation of the largest players in the largest markets. As an anchor partner of Knotel, including Knotel's colossal scale partners — partners who manage 100+ million square feet in the US — the KnotelKoin has the potential to produce a platform that actually gives visibility into the full market.

THE TREND TOWARD THE AGILE OFFICE

Businesses, in the age of the sharing (otherwise known as the metering) economy[17], need to be agile. Companies need to be able to make changes quickly. In the world of commercial real estate, new solutions are needed. One that reduces unnecessary expenses, adds value, accelerates transactions and, most importantly, matches businesses with the spaces they need to thrive at a price that's fair for everyone.

THE INEVITABLE DISRUPTION OF THE COMMERCIAL REAL ESTATE MARKET

Competition within the real-estate technology landscape has grown considerably over the last decade, with the number of start-ups in the industry exploding from 176 in 2008 to 1,274 in 2017 and cumulative venture capital investment growing accordingly.[18] Perhaps the largest players in recent history, companies like WeWork, Regus, and Knotel have begun taking large quantities of property directly under their management and providing it to end-customers in new tenant-friendly, flexible arrangements. Together, this trio manages approximately 10 million square feet in New York City as of January 2018, representing 2.5% of the office market. Like ride-hailing services, these providers have taken large volumes of supply out of the transactional market and onto their platform. As large counterparties for owners, companies like Knotel represent the largest tenants in the city. As counterparties for companies, they represent a new breed of space provider with flexible, fast, simpler processes. Tenant behavior has been conditioned heavily by enterprise products like Knotel Inc., on the one hand, and by consumer on-demand offerings like Uber and Airbnb, on the other. There is no question that tenants expect flexibility and results on demand. Customers have grown increasingly comfortable with conducting research online before making a purchase[19] and they are also clamoring for access to real-time real estate data[20] — demand for transparency in transactions is growing across the globe.[21]

17 https://www.cre.org/external-affairs/cre-2016-2017-top-ten-issues-affecting-real-estate/
18 https://www2.deloitte.com/us/en/pages/real-estate/articles/commercial-real-estate-industry-outlook.html
19 http://www.adweek.com/digital/81-shoppers-conduct-online-research-making-purchase-infographic/
20 https://www.forbes.com/sites/theyec/2015/11/19/four-trends-that-are-reshaping-the-commercial-real-estate-industry/2/#
21 https://www.weforum.org/agenda/2016/08/how-disruptive-technology-could-solve-real-estate-s-transparency-problem/

FUTURE MARKETS

As the market moves toward flexible terms, the type offered by Knotel and the coworking or professional suites operators, the pace of transactional velocity will increase. In the age of mobile devices and remote workers—43% of professional worked from home last year, according to the *New York Times*[22]—many companies simply don't need as much office space as they used to. And those that do might not want to sign long-term leases or to be able to rent out extra unused space in their office. This is why many modern companies are looking for innovative, flexible and adaptable technology-powered office spaces that are designed to boost creativity, increase productivity and encourage impromptu encounters.[23] The era of the multi-year-lease is over and the era of blockchain-based technology is here.

COMPETITIVE ANALYSIS

Mirroring trends in the real estate startup ecosystem, blockchain-based applications are quickly gaining traction. Yet the players in the commercial and residential real estate market attempting to work with blockchain-based technologies are siloed. Propy only focuses on purchasing international real-estate by using the blockchain to circumvent international law, regulations and wiring fees.[24] BitRent is attempting to streamline the financing of construction projects; Etherty is trying to manage real-estate through equity access; Caviar wants to temper the volatility of crypto investments with loans to real estate projects and Trust tokenizes equity in real estate and other real-world assets.[25] On the residential side, outsiders like REX[26] have emerged to improve the market's listings data to minimize listing fees and increase listing exposure while ensuring the integrity and accessibility of data with a decentralized user-verified system on the blockchain. To date, the effort from REX has yielded little engagement precisely because of their lack of an established foothold on the market they are attempting to break into. Knotel will have no such problem due to strong significant connections in the commercial real estate market.

[22] https://www.nytimes.com/2017/02/15/us/remote-workers-work-from-home.html
[23] https://www.designingbuildings.co.uk/wiki/How_technology_is_changing_the_real_estate_industry
[24] https://www.propy.com
[25] https://www.coindesk.com/real-estate-icos-moving-investors-arent-floored/
[26] http://rexmls.com/white-paper.html

CORE MECHANISM OF THE KNOTELKOIN SOLUTION

KNOTELKOIN BLOCKCHAIN PROTOCOL

The blockchain is a public distributed ledger, a database held and updated independently by singular participants (or nodes) over a large network.[27] Blockchain records transactions on a network as "blocks" and securely links them together using cryptography to form a "chain".[28] Information is not controlled by a single party but rather by a by a peer-to-peer network collectively adhering to a protocol for validating new blocks.[29]

Blockchain technology is making many industries reinvent search, access to data, data validation and authentication; commercial real estate will be no exception. The KnotelKoin Blockchain Protocol will allow for those who list to easily find information on existing office space. This will allow for businesses to add another revenue stream in their early stages by seamlessly renting out existing unused office space, not unlike Knotel was able to do in its early stages. Further areas for improvement are enumerated below.

[27] Mougayar, W., & Buterin, V. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet technology. Hoboken, NJ: John Wiley et Sons, Inc.
[28] Ibid.
[29] Ibid.

1. IMPROVE COMMERCIAL REAL ESTATE LISTINGS

The first step in the Commercial Real Estate blockchain is the search process.

Problem:

Many commercial real estate listings are inaccessible without a broker, creating a landscape where listings data is fragmented and it is impossible to efficiently and independently search for office space in the most competitive markets in the world. Key information is kept from consumers at a cost of time and money.

KnotelKoin Solution:

Blockchain experts have predicted that blockchain technologies would be used to bring down "search costs", the cost for finding all of the right information, people, and resources to build businesses.[30] While the internet dropped search costs first within the commercial real estate space (Rick Sharga, executive vice president of auction.com, has noted as such here[31]), it didn't make search anonymous, multi-dimensional, or information uncovered during search inherently valuable.[32] Those who query the blockchain can search by time as an added dimension to see how content has been changed and whom has updated content on the platform, making verification simple and transparent which also enable better decision making in general. The Knotel Blockchain will change the market by offering a trusted office search platform validated by the network protocol. The elimination of search costs will eventually lead to the elimination of brokers and broker fees.

[30] Tapscott, Don. (2017) Blockchain Revolution. New York, New York: Penguin Random House LLC.
[31] https://www.cnbc.com/2015/08/04/20-year-old-office-complex-is-priciest-online-auction-ever.html

2. TRANSFORM FINANCIAL EVALUATION (ASSESS RATES/BID PRICE) AND DUE DILIGENCE PROCEDURES

After the consumer has found a potential property, analyzing and assessing rental rates and bid prices, as well as following closing procedure is necessary.

Problem:

The financial evaluation necessary to assess rates and bid prices as well as the underwriting process for loans in cases of long-term renting and obtaining a mortgage commitment in cases of buying are currently extraordinarily difficult and time consuming. The latter necessitates expensive trust based intermediaries such as lawyers and bankers. For financial evaluation of rates existing platforms and resources often provide unverified or incomplete sources of information. For many properties and transactions, data is either withheld or inaccurate. Rent figures ($/SF) are often inflated, typically between 8-10%, as the data is crowdsourced and, generally provided by brokers and owners who directly benefit from fetching higher rents.

KnotelKoin Solution:

Rental rates and listing prices will be quantifiably accurate on the Knotel Blockchain. Underwriting processes and obtaining mortgage commitments will also be streamlined, as blockchain-based identification verification processes will make it easier to authenticate prospective renters and buyers. Products such as Civic[33] or UPort[34] will be integrated into our blockchain, simplifying the underwriting process. Since these innovative partners are also ethereum-based, integration will take little to no development time. Other ethereum-based companies such as Bloom.io[35] assess both identity and corresponding credit ratings, expediting the underwriting process further. Smart contracts, protocols that create blockchain-based contracts which serve as pre-written agreements allow underwriting decisions to be made faster and more cost-effectively with instantaneously attested contracts.[36] These contracts function as 'multi-signature' accounts, so that funds are spent only when a required percentage of people agree.[37] Most importantly, they store information about an application, such as membership records.[38] Due to their utility, Gartner predicts that 25% of organizations will be using smart contracts by 2022.[39]

32 Tapscott, Don. (2017) Blockchain Revolution. New York, New York: Penguin Random House LLC.
33 https://tokensale.civic.com/CivicTokenSaleWhitePaper.pdf
34 https://whitepaper.uport.me/uPort_whitepaper_DRAFT20170221.pdf
35 https://hellobloom.io/whitepaper.pdf
36 Mougayar, W., & Buterin, V. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet technology. Hoboken, NJ: John Wiley et Sons, Inc.
37 Ibid.
38 Ibid.
39 https://www.forbes.com/sites/rogeraitken/2017/11/21/smart-contracts-on-the-blockchain-can-businesses-reap-the-benefits/#2eccfd9e1074

3. ALLOW FOR SEAMLESS SUB-LEASING PROCEDURES

Once a tenant has settled into a space, there is often a need to seamlessly sub-lease it.

Problem: No structure for seamless sub-leasing currently exists, especially for the short-term. Even with an appropriately-sized space and lease term, tenants may see short-term openings for an additional revenue stream in the form of a sub-lease.

KnotelKoin Solution: Landlords have traditionally been forced to discount their rental fees in exchange for longer term rentals. Landlords that are able to successfully keep their spaces occupied through a Koin-operated listing will achieve higher returns due to the fact that prices for short-term flexible leases in the Koin-operated office space paradigm are 25% to 30% higher than long-term leases. The Koin-operated blockchain allows landlords to offer their vacancies to a wider range of tenants while helping them maximize their return. Listing office space as a Koin-operated listing gives landlords access to a large number of tenants who otherwise would be unable to lease their space under a long term lease. It also allows them to get maximum value from their investment.

[40] Ibid.

THE KNOTELKOIN BLOCKCHAIN PROTOCOL

PROTOCOL DESIGN

The Knotel Blockchain Protocol will launch as a permissioned protocol, but transition to fully open-source almost immediately upon finalizing the token sale. The KnotelKoin Blockchain will utilize ERC 20 as it is designed for ease of listing on exchanges. Consumer smart contracts are viewable on the Ethereum blockchain with ERC 20 so that consumers will be able to access KnotelKoin using wallets that support ERC20 tokens.

STAKING

Since proof of stake relies on the concept of virtual mining and token-based voting[40], the consensus algorithm will take care of any non-network-approved listings and people. The permissioning method will determine who gets to control and participate in the consensus process.

REWARDS

KnotelKoin is the cryptocurrency used to exchange listing data. When an entity posts a listing, that entity is awarded KnotelKoin. When an entity requests to read a listing, that entity is charged KnotelKoin. Ratios of earning to paying are to be determined. Listings on the network will accumulate an increasing score as they continually get verified.

NETWORK PARTICIPANTS

Those participating in the Knotel Blockchain Network will be professionals, experts, information scientists, especially large information and brokerage providers from the existing commercial real estate ecosystem who are incentivized to verify commercial listings (and those who list them) through mechanisms such as user feedback loops and coin payment until the accurate status is reached.

LISTINGS AND LISTING SUBMITTERS

A listing on the Knotel Blockchain has three main components: an address, square footage, and date available. It optionally includes photos, minimum divisible and max contiguous, term length requested, and price requested. Listings are submitted by submitters that fall into many different categories: owner/landlord of the property, [non-]exclusive representative broker, unaffiliated party.

- **Owners and landlords have ownership records reported by the county assessor or sign master leases with the original owner.**
- **Exclusive representative broker agents have state-registered broker ID numbers on a personal level and brokerage ID numbers at an office level. Additionally, they can supply, when requested, letters of exclusive representation signed by the landlord or owner. Non-exclusively represented spaces have personal broker ID numbers and brokerage ID numbers.**
- **Unaffiliated parties have, at minimum, a domain address.**

In an effort to improve the quality of data submitted, Knotel has developed a Data Quality Index (DQI). The Index provides data submitters feedback based on completeness and quality of the data they submitted. Each submitter's DQI will be calculated based on each submitted record's score plus a function of their spam score. Spam score is crowdsourced from flaggers, users and other digesters of the data can 'flag' for errors and that will contribute to the trust the network has from that submitter in the future. Submitters will be able to see their flags and DQI, they can appeal any and a manual process will check for source submissions. Spammers will have their IP addresses blocked from submission.

[39] Mougayar, W., & Buterin, V. (2016). The Business Blockchain: Promise, Practice, and Application of the Next Internet technology. Hoboken, NJ: John Wiley et Sons, Inc.
[40] Ibid.

USER FEEDBACK LOOPS

User Feedback Loops will be facilitated with listing flag mechanisms. Listing flags by anonymous users typically come in user-facing websites and can be used as a broad tool to catch spammers susceptible to false flagging. Listing flags by known entities involve a unique ID of the flagging entity that can be recorded over time to evaluate trust as well as tokenize helpful behavior. Listing flags by known entities of those submitted by licensed real estate professionals allow them to evaluate and validate their state-based license credentials. Reports of misrepresented listings can only be made by licensed real estate professionals with validated license credentials or owners of the property with validated ownership paperwork.

SCORING

The validation system sits upon various scoring systems that improve over time, operate within a transparent methodology, and are fundamentally auditable. End user feedback systems are naturally ingested into the database itself, and the source of the data, including both the broker and landlord, are scored such that penalties are incurred for any type of abusive behavior.

ORIGINAL SOURCE SCORING

The percentage of listings submitted without being flagged is the raw confidence indicator for the source, or the lister. The percentage of listings submitted and not flagged that then have no other source that submits the same listing or is followed by an identical listing submission by a duplicative source is called the original source score and rewards the source that first submits the listing to the blockchain.

SMART CONTRACTS

A smart contract will be established each time a user submits data to the database. A bounty will be held on the contract and paid out after validation of data. Data validations will also pay out smaller sums of tokens to the later parties. A validation can either be confirmed against the KnotelKoin Core API, or with multiple entries from other parties.

Data submitted to the network will be published, but payouts of KnotelKoin will sit on an unsettled Smart Contract for 90 Days. This contract will pay out if there is no flags on the data and their is at least 2 confirmations from coreAPI or other submitters. If this data is flagged, the appeals process nulls the contract.

DATA VALIDATION ERROR

There are three main types of data validation errors that the blockchain will eliminate: **negligence; bait and switch; and misrepresentation of listings.** Sources from landlords and listing agents will often report listings as available when they have long since become not available out of **negligence**. One example is a listing that is currently **"in leases."** The space has not technically been taken, but the landlord won't take the listing down. **Bait and switch** is when a landlord or a listing agent purposefully shows a listing that is not available in order to get the tenant in the door and show them other availabilities in the building or nearby. Lastly, tenant representatives **misrepresent** listings in order to gain tenant contact information as part of a lead list generation.

ROADMAP

Past	**2016**	Knotel launches its real estate business
	2017	Knotel accounts for ~15% of significant New York submarket deals
	2017	Q2 - raises 25 Million series A
	2017	Q3 - launch San Francisco Office
	2017	Q4 - Employee count quadruples since Q1
Present	**2018**	Knotel goes International, launching London office
	2018	KnotelKoin Whitepaper 1.0
	2018	KnotelKoin Team Forms
Future	**2018**	Q2 Private Pre-sale Opens
	2018	Q3 Smart Contract Creation
	2018	Q3 Product Development
	2018	Q3 Platform Launches
	2018	Q4 Software Development
	2018	Q4 Innovative Partnerships
	2019	Q1 MVP Launch

THE KNOTELKOIN TEAM

AMOL SARVA | CO-FOUNDER AND CEO | KNOTEL

Amol Sarva, the co-founder and CEO of Knotel, studied Philosophy and Economics at Columbia and has a Ph.D. from Stanford with his dissertation titled “The Concept of Modularity in Cognitive Science”. Prior to launching Knotel, Amol co-founded several technology companies, including Virgin Mobile USA, Peek, Halo Neuroscience and Knotable. He also developed East of East, a residential condominium building in Long Island City. Amol teaches at Columbia University and has served as an advisor to more than 50 companies.

EDWARD SHENDEROVICH | CO-FOUNDER AND EXECUTIVE CHAIRMAN | KNOTEL

Edward Schenderovich, the co-founder and executive chairman of Knotel, holds a bachelor of arts degree from the University of California-Berkeley. Prior to launching Knotel, Edward co-founded Kite Ventures, a venture capital firm that invests in early-stage tech startups. He also co-founded QuantumArt, Merchantry (acquired by Tradeshift), Knotable and SUP Media. Edward advises several companies and is a published poet.

CONCLUSION

In today's digital age, there should be a way for people to engage in commerce in a secure and reliable way without having unnecessary intermediaries. The promise of the blockchain is to decentralize money, giving people more control over their own funds. The commercial real estate industry is the next industry blockchain will disrupt.