

WHY

BLOCKCHAIN TECHNOLOGY

WON'T REPLACE TITLE INSURANCE



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INTRODUCTION

It's hard to open a newspaper today (or, more accurately, scroll through the news) without seeing an article about blockchain. The hype of this new technology is taking our society by storm with many touting its wide-ranging benefits. There are potential applications of blockchain technology that touch the title insurance industry. Enthusiastic proponents argue that these systems would be so efficient and secure that they would eliminate the need for title insurance. However, this argument ignores the fundamental purpose of title insurance: to protect a homeowner against undiscovered title issues by providing assurances of property rights and paying title claims. Blockchain technology will not replace title insurance; rather, it will ensure that the title insurance industry will endure.

To start, it is critical to dispel one of the most common myths surrounding blockchain: that it is the same thing as Bitcoin. Cryptocurrencies, like Bitcoin, (which is peer-to-peer digital money) and blockchain are so often discussed in the same conversation that it is understandable that the two are conflated into one. However, it is important to understand that the blockchain is the underlying technology that allows Bitcoin to operate. Think of the blockchain as the internet and Bitcoin as an internet site. Bitcoin couldn't operate without a blockchain, but there are many uses for blockchain technology aside from mining and trading Bitcoin.

WHAT IS TITLE INSURANCE?

A title insurance policy provides monetary relief for title defects. Both a homebuyer and/or a lender may obtain a title insurance policy. An owner's policy protects a homeowner's property rights against certain future claims regarding ownership of their property. A lender's policy is generally required by the lender prior to extending credit to the homebuyer and will protect the lender's financial investment.

Unlike other forms of insurance, title insurance provides coverage for past events that may affect the homeowner's ability to enjoy the property rather than coverage for the possibility of a future event that may cause a loss.

Title insurance protects against countless title issues that could affect the homeowner. These issues include obligations secured by the property, including unknown outstanding mortgages, judgments, and tax liens. Such issues also include use or ownership of the property by another, such as a neighbor, through prescriptive easements, encroachments, or adverse possession. Title insurance will also protect a homeowner against pending or anticipated legal action against the property and ownership claims of unknown heirs of a previous owner.

Title insurance also protects against misdeeds and mistakes committed by others. Title insurance will provide relief for title claims relative to forgery, which is when a person falsifies a document,

and fraud, which is when someone uses deception to achieve unfair gain. Title insurance will even cover loss due to a clerical error which causes inconsistent or inaccurate land records.¹

Upon a loss event, the title insurer will pay costs, attorney's fees, and expenses incurred in defense of the title, in accordance with the policy's terms. As discussed later in this paper, this is a function that blockchain cannot perform.

How the current process works

Prior to issuing a title insurance policy, a title insurer will order a title search be performed. A title searcher will review the public records relative to the property being conveyed, collect all relevant documents, and provide them to the insurer or title agent for underwriting. That individual will review "a daunting assortment of public documents related both to the insured property itself and to all parties who ever had an interest in the property" to determine whether there are any defects in title.² The title professional will also determine how to remediate any such defects to ensure the homebuyer will not face any problems related to his or her title to the property in the future. An estimated 30% of properties experience title defects that require curative action before a title policy can be issued.³

The integrity and accuracy of the current land records is largely monitored by title insurance companies and title agencies as part of the title examination process. If a defect is found that needs remediation, the title insurer or agent will require an update be recorded in the land records to fix this title defect so that future conveyances of the property are not subject to the same recurring problems. According to Dr. Nelson R. Lipshutz, renowned consultant to the title insurance industry, "in the absence of title insurers' and title agents' curative activity, the prevalence of title defects would double."⁴ The remedial work performed by title insurance professionals and attorneys enables more efficient real property conveyances and creates a system in which homeowners can trust that their property rights will be protected.

WHAT BLOCKCHAIN IS

The Basics

At a most basic level, blockchain is similar to a database. How it functions, however, is more complicated. Blockchain utilizes distributed ledger technology to store data, meaning that the data on the blockchain is shared across all of the nodes (think, computer) on a network. Each network could include tens to thousands of nodes. This means that no one source holds the dataset, but rather it is held by each node in the network.

When a transaction is executed, the information that forms the transaction is held on a "block" that is connected to other related transactions through unique digital fingerprints, called "hashes."

¹ American Land Title Association. "Homebuyer Outreach Program." ALTA.org, www.alta.org/homebuyer/.

² Spielman, Avi. "Blockchain: Digitally Rebuilding the Real Estate Industry." MA Thesis, Massachusetts Institute of Technology, 2016, 17.

³ Spielman, 16.

⁴ Lipshutz, Nelson R. "The Role of Title Insurance in Mortgage Finance and Home Ownership." *Regulatory Research Corporation*, 8.

Block #341670

Summary	
Number Of Transactions	1031
Output Total	6,946.47997159 BTC
Estimated Transaction Volume	1,083.83459534 BTC
Transaction Fees	0.15136372 BTC
Height	341670 (Main Chain)
Timestamp	2015-02-02 19:28:12
Received Time	2015-02-02 19:28:12
Relayed By	BTCC Pool
Difficulty	41,272,873,894.7
Bits	404399040
Size	376.779 kB
Weight	1506.864 kWU
Version	2
Nonce	1454348738
Block Reward	25 BTC

Hashes	
Hash	0000000000000000062e8d7d9b7083ea45346d7f8c091164c313eeda2ce5db11
Previous Block	0000000000000000c05a2f67ea3f3d84adb452dd21736596c3ec4856a1a1dc2
Next Block(s)	0000000000000000d14002147edbf73762c02bee6a0e583e0b41569fee09e66
Merkle Root	56e6570cdb2e9787f046fb78e502a6377375293df2786b24be1db0b20c3e7ac1



The data comprising a block

A complete and accurate copy of this data is stored by each node on the blockchain

Luckily, much like how few of us know the complexities of how our car's engine works, there is not a need for all of us to understand the intricate mechanisms that underlie the blockchain. What is helpful for most of us to understand is why blockchain may provide solutions to some of the biggest issues plaguing our society, and the limitations of this new technology.

The Benefits of Blockchain

Security

The distributed ledger protocol, or set of rules, that defines a blockchain enables it to more safely store information in the blockchain database. Jamie Smith, CEO of the Blockchain Business Council and head of communications for leading blockchain technology company BitFury, describes the traditional database as a house. Smith points out that the current centralized database model is secure, stating that “[i]t’s hard to break into a house, but not impossible,” adding that “cybersecurity is just a lot of really fancy ways to protect that house.”⁵ Moving the database to a decentralized, distributed model means that, “[i]nstead of breaking into a house, you now have to break into an entire town,” as Smith describes it.⁶

⁵ Woolf, Nicky. “Everything You Need to Know About Blockchain But Were Too Embarrassed to Ask.” Medium, Augmenting Humanity, 21 Dec. 2017, medium.com/s/welcome-to-blockchain/everything-you-need-to-know-about-blockchain-but-were-too-embarrassed-to-ask-b3cee3e918f8.

⁶ Ibid.

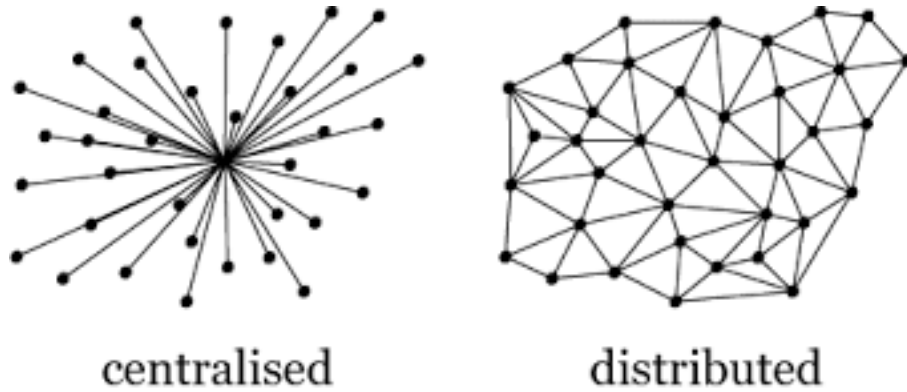
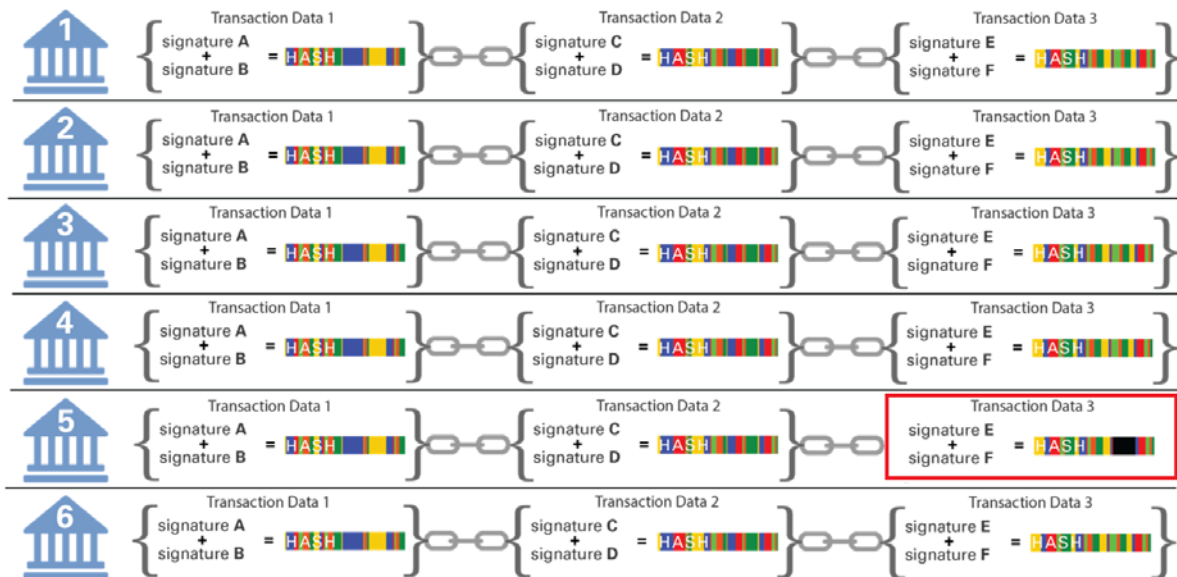


Image Source: Google

Illustration of centralized versus distributed networks

If a hacker were able to hack into a blockchain block, any manipulation of the ledger would be immediately and permanently visible. The graphic below shows how blocks of the blockchain are validated by individual nodes. When a transaction does not match the others (such as in Transaction Data 3 of Node 5), it will be corrected by the others via consensus. This process ensures that each copy of the blockchain stored by each node is identical. The ability of the blockchain to detect erroneous or potentially fraudulent information helps ensure the reliability of the data. This capability makes it an ideal technology for providing a record of ownership.



Source: Goldman Sachs Global Investment Research.

Large, public blockchains are inherently more secure than private, permissioned blockchains. In order “[t]o compromise a blockchain, an attacker must compromise over 50 percent of the

participants or blocks, and do so faster than new blocks are created.”⁷ In other words, a larger blockchain would naturally require more blocks to be jeopardized, and it would also lead to the possibility that the blockchain’s users would create new blocks before the hacker’s mission is achieved.

By embracing blockchain as a database for public records, such records can be better insulated from cyberattacks, mismanagement by town or county record holders, and possible destruction of records while maintaining a public identity.⁸ The importance of keeping public records accessible is critical for our society, which depends on the integrity of these records to transfer property among many other public functions. By moving records onto a blockchain, the nature of the records can remain unchanged and continue to provide the same value to our communities while enjoying added benefits of security, transparency, and efficiency to the records.

The blockchain has the added ability to “significantly reduce title fraud risk as well as reduce the possibility of human error being introduced into the ‘chain of title’ over time.”⁹ While the blockchain cannot eliminate these concerns, it can help form a system that will better detect potential fraud or erroneous or mistaken records and flag such transactions before they are included on the chain. Human involvement will continue to be necessary, however, to cure situations flagged by the blockchain to help ensure the integrity of the records.¹⁰ This need guarantees the continued reliance on the title insurance industry to clear defects affecting title to real property.

Immutable

Since each node on a blockchain network holds a complete and accurate copy of the chain, any attempt by one node to make a change will be immediately detected by other nodes on the network. As stated above, blockchain relies on consensus. If the required number of nodes reaches a consensus about a change, that change to the chain is permitted. However, if no consensus can be reached, a change will not be authorized. Moreover, information on the chain can only be added. Existing blocks cannot be edited or modified to erase information already on the chain due to the inherent recordkeeping structure of the blockchain model.¹¹ This process is how immutability on the blockchain is achieved.

The allure of blockchain technology to the title industry is that it creates an authentic record of transactions that cannot be subsequently altered or removed from the blockchain. The integrity of land records relies on an immutable registry of documents that provide proof of land ownership. A recent study of blockchain by the State of Vermont found that accuracy and trustworthiness of records are critically important to the usefulness of the records. Assuming that accurate information was submitted to the blockchain at the outset, the immutable nature of the blockchain

⁷ Grimes, Roger A. “Hacking Bitcoin and Blockchain.” CSO Online, InfoWorld, 12 Dec. 2017, www.csoonline.com/article/3241121/cyber-attacks-espionage/hacking-bitcoin-and-blockchain.html.

⁸ Spielman, 42.

⁹ The Goldman Sachs Group, Inc. “Blockchain: Putting Theory into Practice.” *Profiles in Innovation* (2016), 36.

¹⁰ See Spielman, 51.

¹¹ See “Immutable – or is it?” section *supra*.

can help promote these objectives, as it provides assurances that the data has not been tampered with or corrupted.¹²

The blockchain protocol also recognizes the need to correct information on the blockchain due to an error or a change in circumstances that renders information included on a previous block inaccurate. If “bad data” is recorded in the ledger, it is “possible to add entries that correct previous, erroneous ones.”¹³ This possibility allows flexibility for data included in the blockchain. However, as mentioned above, the ability to change information already included on the blockchain is extremely limited since any changes to previous blocks would be recognized and visible on the chain. This limitation on modifying information in the blockchain raises concerns relative to confidential information, as later discussed.¹⁴

Transparent

The inherent nature of the blockchain to record each related transaction on a single chain will have fundamental effects on the underlying process of real property transactions. The method of storing information on the blockchain means that title searches will be more transparent and less burdensome.¹⁵ No longer will title examiners need to create a chain of title by searching grantor/grantee indexes in the public records. Rather, under a blockchain model, a title search could take mere minutes since each transaction relative to the property is recorded within blocks on the same chain.

Of course, this presumes that all historical records have been properly added to the blockchain, a process that assuredly will take many dedicated resources. As blockchain becomes the method of storing public records, such information will become “increasingly robust and more widely trusted,” enabling the blockchain database to eventually replace traditional paper documents and current digital land records.¹⁶

Efficient and organized

The importance of maintaining accurate public records forms the basis of a well-functioning society. Acclaimed economist Hernando de Soto observed that “[f]ew seem to have noticed that the legal property system of an advanced nation is the center of a complex web of connections that equips ordinary citizens to form ties with both the government and private sector, and so to obtain additional goods and services. Without the tools of formal property, it is hard to see how assets could be used.”¹⁷

¹² See “Necessity for a gatekeeper” section supra.

¹³ Bateman, Alexis, and Ken Cottrill. “Blockchain’s Garbage In, Garbage Out Challenge.” Supply Chain @ MIT, Massachusetts Institute of Technology, 19 Oct. 2017, supplychainmit.com/2017/10/19/blockchains-garbage-in-garbage-out-challenge/.

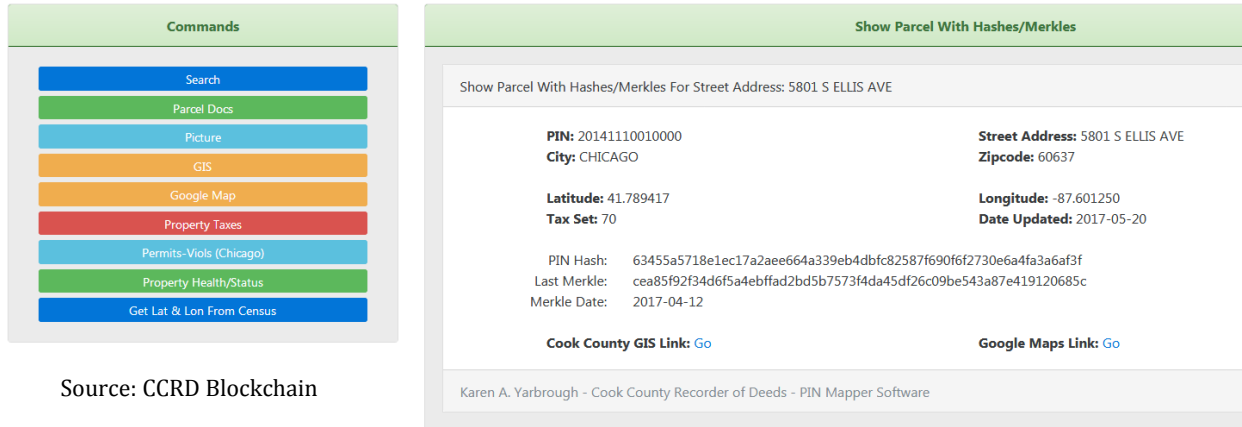
¹⁴ See “Immutable – or is it?” section supra.

¹⁵ See The Goldman Sachs Group, Inc., 36. See also Spielman, 51.

¹⁶ Spielman, 46.

¹⁷ Soto, Hernando de. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books, 2000.

Blockchain technology has the ability to organize land records in a manner that makes them more easily searchable while reducing concerns related to fraud and human error. For example, a Bitcoin blockchain was successfully implemented in the Cook County, Illinois, Recorder of Deeds (“CCRD”) land title registry. According to its May 2017 summary report, the CCRD’s Blockchain Pilot Program illustrated that the land records, municipal department records, tax records, assessor records, etc., could be consolidated into a single blockchain system, making it possible to conduct more thorough and efficient searches.¹⁸ This new process can be very broadly described as digital abstracting.



Source: CCRD Blockchain

Public-facing hashing summary on CCRD.org and Data Oracle Tabs

Cost efficiencies

Worth an estimated \$31.8 trillion, it is understandable why the real estate industry is a target for fraud.¹⁹ In fact, 30% of title insurance losses are fraud-related.²⁰ Adopting a safer land registry database has the potential to save the real estate industry \$2-\$4 billion in costs, according to the 2016 Goldman Sachs report.²¹

In addition, title insurers could reduce overhead costs associated with performing title examinations by embracing blockchain technology. A blockchain land registry would enable title examiners to perform title searches in a matter of minutes due to the ease of locating records relevant to a property. Blockchain technology also has the ability to reduce some of the transactional risks prevalent in the current recording process, such as indexing errors.

It is critical to note, however, that blockchain technology cannot replace the current processes required to enter and reconcile data entered onto the blockchain. Such processes will continue to be performed by humans and be subject to human error. Thus, blockchain cannot completely

¹⁸ Mirkovic, John. “Blockchain Pilot Program: Final Report.” (2017) Recorder of Deeds: Cook County, Illinois. 30 May 2017.

¹⁹ Zillow Research. “Total Value of All U.S. Homes: \$31.8 Trillion. How Big Is That?” Premier Agent Resource Center, Zillow, 28 Dec. 2017, www.zillow.com/research/total-value-homes-31-8-trillion-17763/.

²⁰ Spielman, 28.

²¹ The Goldman Sachs Group, Inc., 7.

eliminate costs associated with risks in land transfers, but it can help identify some of those risks and mitigate them.

The Limitations of Blockchain

Necessity for a gatekeeper

As discussed above, the implementation of a blockchain land registry system will not replace the need for human oversight. Much like there is currently the need for a town or county clerk to review documents submitted for recording in a traditional land registry, there will be a similar need for such a party to review documents submitted to a blockchain land registry. This gatekeeper will need to perform similar functions as town or county clerks perform today, including reviewing documents to ensure they conform with state and local requirements and to ensure that no non-public, personal information (such as social security numbers) is included in any document submitted for recording.

It is important to recognize the limitations on a town or county clerk, which would also be applicable to a blockchain recording system. When a document is submitted for recording, the town or county clerk will review the document to ensure it meets standards for recording. Such standards dictate the format of documents submitted for recording and include criteria relative to permissible abbreviations, how to format entity designations, such as ownership by a corporation or trust, recording procedures, among others. The town or county clerk does not perform any title search in connection with recording documents and therefore cannot determine the legality or enforceability of a document submitted for recording. That is the job of title insurance professionals.

As a dataset platform, blockchain will perform similar functions as the current town or county clerk and will face similar shortcomings. A blockchain land registry will not be able to identify possible title issues or correct any existing title defects. Moreover, a blockchain registry will be unable to determine the legality and enforceability of a document on the chain. This job will remain the responsibility of title insurance professionals. The blockchain will simply store the data provided to it, albeit in perhaps a more transparent and searchable format. Most importantly, just as town and county clerks currently do not pay claims relative to title defects, neither will blockchain.

While blockchain has the ability to promote efficiency and more transparent title searches, the benefits of the blockchain are only as good as the data provided to it. As detailed in the Vermont blockchain study, “[b]lockchain technology offers no assistance in terms of reliability or accuracy of the records contained on the blockchain; if bad data is used as an input, as long as the correct protocols are utilized, it will be accepted by the network and added to the blockchain.”²² Thus, while the blockchain helps to ensure that the data retained has not been tampered with, it offers no protection against the recording of incorrect or inaccurate data.

²² Condos, James, William H. Sorrell and Susan L. Donegan. “Blockchain Technology: Opportunities and Risks.” (2016) 15 Jan. 2016, 10.

Not only does this limitation of blockchain necessitate a gatekeeper to keep intrinsically bad data off the blockchain, it also requires the expertise of title insurance professionals to perform the title review functions commonly practiced today. Such underwriting functions include reviewing documents to ensure they are legally enforceable and reviewing defects to title that could affect the property interests of a homebuyer. These functions will not be made obsolete by blockchain technology, nor its developers, because the technology is a mere storage facility for title records.

Difficulty in understanding blockchain

The complexities of how blockchain operates may be a barrier to its widespread acceptance. At the beginning of this article, it was argued that one can interact with the blockchain without understanding the intricacies of the technology. However, it is critical that towns, cities, or counties that are tasked with maintaining the integrity of the records stored on the blockchain understand such complexities. To use the car analogy once more, while an owner of a car may not need to know how the engine works, the party tasked with maintaining the car (a car dealer, for example), should have a more comprehensive understanding.

The question is: will these towns, cities, and counties trust this new blockchain technology to store integral land registries? This is certainly a hurdle that blockchain proponents will need to overcome before the technology will become widely accepted.

Blockchain can still be hacked and compromised

Hacking the blockchain is more difficult than hacking a centralized system, but an implementation of blockchain may still be vulnerable to hackers. Simply put, moving records onto a blockchain will not prevent such records from being the target of a hacking expedition. The systems that implement blockchain technology are dependent on computer code, which tells the system how to operate. This code is developed by humans, and thus there may be inherent vulnerabilities in an implementation of blockchain. Think of these vulnerabilities as leaving a window unlocked in your house. The house from the outside looks secure; however, a criminal could approach the house, try to open every window, discover the unlocked window, and succeed in gaining entry to the home. Hackers operate the same way, testing points of entry and trying to discover whether any vulnerabilities in the code give way to accessing the blockchain.

Moreover, when the blockchain is integrated with other systems (such as an application or database that exists outside the blockchain), such integration points often form weak spots in the security of the chain, enabling hackers to have an easier shot at successfully hacking the blockchain.

While the blockchain is more protected against hackers than a centralized system, a cybercriminal can easily impersonate an authorized blockchain user by stealing his or her private cryptographic key. A private key is much like a password and gives the user the ability to add and verify transactions on the chain. Presumably, only the true owner of the key would have access to it. However, if a hacker can misappropriate the private key, the cybercriminal can act with the authority of a legitimate blockchain user. Such authority would give the cybercriminal the ability to create valid transactions, and thereby undermine the accuracy of the blocks on the chain. Currently,

there is “no recourse available within the blockchain technology should a private key be lost or stolen.”²³

Transparent – or is it?


All of those who have access to a blockchain can view the data contained within it. Blockchains can be either public or permissioned, which dictates who can add information to the blockchain. Blockchains are also either open or private, which indicates who can see the information held on the blockchain.

Public blockchains enable all parties to add information to the blockchain. An example of a public blockchain is Bitcoin, which allows any person to purchase Bitcoin and each holder can add and verify transactions on the chain. Bitcoin is also an example of an open blockchain as information on the chain can be viewed by anyone and is not limited to Bitcoin holders.

Bitcoin Address

Addresses are identifiers which you use to send bitcoins to another person.

Summary		Transactions	
Address	152f1muMCNa7goXYhYACQ61hxEGacmncB	No. Transactions	20376
Hash 160	2c30a6aaac6d96687291475d7d52f4b469f665a6	Total Received	351,587.1551712 BTC
Tools	Related Tags - Unspent Outputs	Final Balance	0.00765335 BTC



Transactions (Oldest First) Filter ▾

160c8724eb5f962955db1354e511e5741e73e1b26a1b97ec2b99f6b75034bfc	2018-05-02 01:42:17
13ymtdVoNjQQLR1k8eyjp6iS3rU7PZVWeP	0.00044341 BTC
➔	152f1muMCNa7goXYhYACQ61hxEGacmncB
	0.00044341 BTC

An example of a Bitcoin stored on Block #341670

Permissioned chains, on the other hand, permit only certain authorized users who hold private, cryptographic keys to add information to the chain. Such keys, as described above, are analogous to passwords and allow the holder of the key entry to the blockchain upon verification of the holder's identity.

Permissioned, private blockchains provide assurances that only authorized users can add and view information on the chain, which could usher in major advances in areas that concern corporate compliance departments. Undoubtedly, there are benefits to creating a permissioned blockchain, particularly for private enterprises or when information stored on the chain is confidential or personal. The non-public, personal information (“NPI”) that financial institutions (including title companies) must protect under the Gramm-Leach-Bliley Act is one example of the type of information that a permissioned blockchain could shield from public view. As an additional security

²³ Spielman, 37.

measure, information within blocks can be encrypted to prevent authorized blockchain users who lack credentials to access NPI from viewing the information.

Permissioned blockchains do not need to be completely private, however. Accordingly, they are a feasible option for land registries. In a permissioned, open blockchain, only select, authorized users, such as county or town clerks, would have the ability to add information to and verify records in the blockchain land registry. This function preserves the gatekeeper role for town and county clerks that is imperative to maintaining the integrity of land records. Verified records on a land registry blockchain could be open and visible to the public, as required by federal and state public records laws.

In this sense, a blockchain land registry would operate similarly to the current land registry systems in which documents are provided by the public and reviewed and approved by the county or town recorder prior to inclusion in the land records. Only upon approval by the recorder do the documents become part of the public records.²⁴

Immutable – or is it?

A recent development by consulting firm Accenture touts the ability to edit the content of the blockchain in certain situations.²⁵ The consulting firm points out that there are a multitude of situations that could lead to a desire to redact information on the blockchain, including accidental inclusion of NPI, incorrect data, or information that violates regulatory requirements. The ability to change the data on the chain is appealing to the financial services industry, according to Accenture, due to ever-changing regulatory requirements. Currently, regulations including the U.S. Fair Credit Reporting Act, the Gramm-Leach-Bliley Act, and the SEC's "Regulation SP" all require redaction of certain financial information.²⁶

Under a blockchain model, it is feasible to encrypt certain information stored on the chain to prevent disclosure to unauthorized parties. Such capability allows information stored on the blockchain to comply with the aforementioned regulations when such confidential information is identified prior to inclusion on the chain and is properly encrypted. However, when information is not properly classified as confidential NPI, there is concern that such information could become a permanent part of the chain. Under the current regulatory regime, such confidential information could be accidentally included on a chain. It is also possible that regulations could change in the future, requiring information not currently considered NPI to be treated as such, which would require information already on the blockchain to be deleted.

Complicating the situation is the European Union's "Right to be Forgotten" under the recently enacted General Data Protection Regulation ("GDPR"). Under this regulation, a citizen of the EU is

²⁴ Such an approach was implemented in Sweden as part of its blockchain land records initiative. Lantmäteriet, et al. "The Land Registry in the Blockchain – testbed." (March 2017).

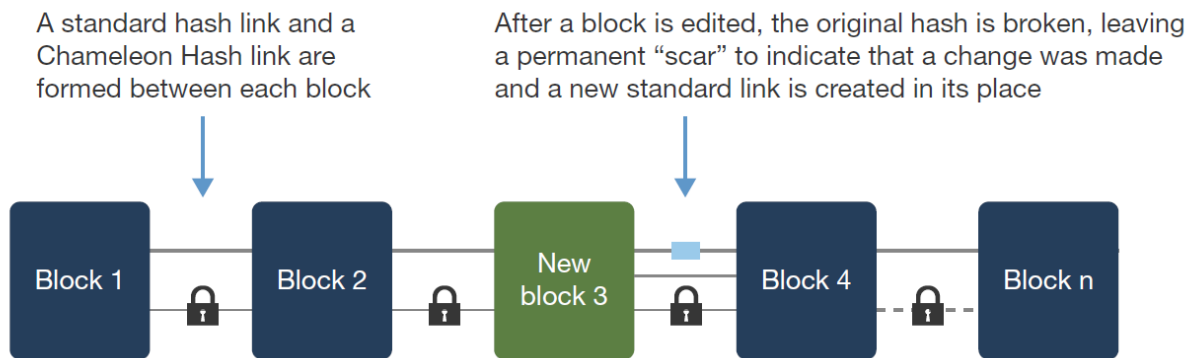
²⁵ Bennett, Martha, et al. "Don't Dismiss Accenture's Blockchain Redaction Solution – You May Need It One Day." Forrester Research Inc. 19 Apr. 2017.

²⁶ Ibid.

entitled to request any data controller to remove personal information of the individual.²⁷ This requirement comes in direct conflict with the traditional blockchain model, which is premised on immutability of data on the chain. As blockchain technology makes extractions of information difficult, if not impossible for large, public blockchains, there are questions as to whether a blockchain system could be used for storing personal information of EU citizens.

As integrations with blockchain technology become more widespread, challenges based on privacy laws and regulations are bound to increase. Accenture argues that “well-governed, tamper-evident systems” should be the goal rather than immutable data sets.²⁸ Accenture’s redaction solution can be applied only to permissioned blockchains in which “‘immutability’ is really just the result of the governance principles agreed upon by the participants.” Blockchain users must agree to make it “comparatively easy for participants to collude and subvert a chain” before the information on the blockchain could be altered. In other words, users must agree to change a block and reach a consensus about the modified block before a block can be changed.

Redaction technology works by isolating a block from the chain and updating, or replacing, the block. After the necessary changes have been made, the block is entered back into the chain by replicating the hashes that originally connected the block to its preceding and subsequent block. Such a process leaves a “scar” on the blockchain, indicating that the block had been edited, providing a record of the changes made to the chain. The graphic below demonstrates how the redaction technology can be applied to the blockchain.



© Accenture 2016

Critics of this capability argue that the ability to redact information on the chain undermines the technology’s core objective to create an immutable record. Taking this criticism into account, enterprise blockchain owners must consider whether this technology would benefit the purpose of their dataset. On the other hand, the critics should bear in mind that the concerns that corporate

²⁷ Wilke, Stefan. “Blockchain Data Protection Law | Deloitte Legal Deutschland.” Deloitte United States, 11 Apr. 2017, www2.deloitte.com/dl/en/pages/legal/articles/blockchain-datenschutzrecht.html#.

²⁸ Bennett, “Don’t Dismiss Accenture’s Blockchain Redaction Solution – You May Need It One Day.”

compliance departments might have about privacy laws may mean that a truly open, immutable blockchain is simply not an option.

WHAT BLOCKCHAIN ISN'T

Since one way to think of a blockchain is simply as a database, there are many current functions relative to land transfers that a blockchain cannot perform. In a real property conveyance, there are a multitude of parties necessary to ensure a seamless transaction. Real estate agents, loan officers, title insurers, independent title agents, and real estate attorneys are all integral to the settlement process in the United States. Each of these parties brings to the transaction specialized knowledge that helps ensure that both the buyer and seller are getting the deal that they want.

The real estate industry is broad and includes many stakeholders. Perhaps the industry that would be affected most by the application of blockchain technology is the title insurance industry. Some in the industry have argued that the implementation of blockchain technology will diminish the need for title insurance. Such a belief points to an inherent misunderstanding of what title insurance is and the protections it provides.

What title insurance can do that blockchain can't

Identify title defects

Title defects can be identified only upon a review of the land records. Blockchain can help make searches of land records faster and more efficient by aggregating and associating records relative to each property. Such efficiencies could lead to decreased title insurance costs. However, similar to the limitations of the current recording system, the blockchain does not have the capability to review documents and detect any possible issues related to title. Such job will continue to be performed by title insurance professionals and attorneys.

Correct title defects

Upon discovery of a title defect, a title insurance professional or attorney will need to determine how to resolve the issue to ensure the transaction can be completed and that the homebuyer can receive good, or "marketable," title to the property. The majority of the curative work performed by the title insurance professional or attorney is done in advance of the closing, oftentimes without the buyer and seller being aware of such defects. By resolving potential issues at the outset of a transaction, the title insurance professional or attorney can help ensure that the new homebuyer will not be subject to any subsequent claim against the property by a prior interest holder.

Protect consumers' property rights

Typically, purchasing a home is the largest investment a person will make in his or her lifetime. An owner's title insurance policy is the only way to protect a homebuyer's investment against another's claim of ownership in the property. Title insurance helps provide the homebuyer with peace of mind that he or she will not be required to pay certain existing debts or resolve legal problems related to the home following closing. As discussed above, blockchain is merely a method of storing data and not an insurer. Thus, even under a blockchain land records system, title insurance will be essential to ensure consumers' property rights are protected.

As mentioned above, while it is possible that technology may provide solutions for some of the specific types of human error that lead to bad data being recorded on the blockchain, such errors will never be fully eliminated as long as people are involved in the process. This has been referred to as the “garbage in, garbage out” dilemma by some in the blockchain community.²⁹ Blockchain technology will be subject to the same commonplace human errors as the current land recording system.

Moreover, there are many other risks that are not conspicuous in a land registry that call a recorded real estate title transaction into question. For example, failing to follow proper legal procedures in a foreclosure action could render a title unmarketable. Such “off-record” title defects arise by events unobservable from the land records, and can usually be discovered only by a skilled title insurance underwriter or title agent.

Some blockchain developers claim that their technology will eliminate the need for title insurance. However, it is difficult to imagine how a digital ledger could identify the foreclosure defect in the example above. On the contrary, the title insurance industry will continue to insure against these risks and protect property rights.

Pay claims

Perhaps the most important reason why a person will purchase insurance is the understanding that there will be monetary compensation in the event something goes wrong. In 2017, the title insurance industry paid approximately \$546 million in total claims.³⁰ For those who assert that the blockchain will eliminate the need for title insurance, a question that must be answered is: can blockchain technology make whole a homebuyer or a lender who suffers a title loss? The answer is no, but the title insurance industry can.

Moving records to the blockchain will not eliminate the need for insurance as there will still be defects in titles that need to be cured. Many of these issues will come to light following the closing, and will be the subject of a title insurance claim. Without title insurers in the equation, there will be no party to subsidize these losses, and thus it will turn to the homeowner to pay out of pocket to defend against subsequent claims. Such a result would inevitably lead to homeowners losing their homes due to financial strain.

WHAT DOES THE FUTURE HOLD?

Ultimately, the successful application of blockchain technology depends on the buy-in of all real estate industry participants. Encouraging all parties to invest in the blockchain could be a difficult impediment to overcome. Moving to a blockchain system would require massive investment of resources and the complete overhaul of current systems. The cost alone to government land recording offices to undertake such an endeavor would be staggering.

²⁹ Bateman, “Blockchain’s Garbage In, Garbage Out Challenge.”

³⁰ American Land Title Association, *Annual Statement for the year 2017*, 2018. Web. 29 May 2018.

Another major concern is whether mortgage lenders will trust this new technology to hold their financial investments in real estate. According to a Goldman Sachs report, “[w]hether or not mortgage lenders (a highly fragmented industry) would be receptive to the use of blockchain in carrying out property title searches is unclear, and they could potentially push back owing to unfamiliarity with the technology.”³¹

Will blockchain create new risks?

One important thing to consider as the marketplace continues to promote blockchain technology is to understand that the current land registry system works well. Moving records to a blockchain may make certain processes more efficient, but it will not eliminate all of the risks associated with real property conveyancing. Fraud and forgeries can still happen; title issues will still arise; documents will still be misindexed, requiring curative action.

Implementing blockchain also has the possibility of introducing unanticipated and additional obstacles.³² Any flaws that are created as a result of the limitations of the system will be the lifeblood of new categories of risk that we cannot imagine today. If insuring real estate titles over the past century and a half has taught the title insurance industry anything, it would be that risks are constantly evolving as conveyancing practices and requirements change.

Wrapping our heads around what these new obstacles may be is a difficult task. What our society will look like after embracing blockchain technology may be much different than we can imagine. Such new challenges may pose the need for additional insurance protections, perhaps to protect against a collapse of a blockchain or a cyber hack. As processes become more automated, there will likely need to be coverage for occurrences that fail to automate as expected. The title insurance industry will likely be called upon to help solve and insure against some of these problems.

CONCLUSION

Blockchain technology holds infinite possibilities that could help make current processes in our industry and society more efficient. While technology can help resolve some of our society's problems, it is not a fix for all issues. Before implementing blockchain technology, it is critical to question if there is a problem that is ripe for this technology to solve. In the case of land registries, it is not apparent that the benefits that blockchain technology would provide would outweigh the burdens of implementation.

It is important to note that our current processes work well. Compare the state of the land records in India, which has been described as “abysmal” due to the country's “presumptive ownership” land records system.³³ This system suffers from inconsistent land records between governmental departments, fueled by bribes to public officials to alter records. Given the lack of consistency and

³¹ The Goldman Sachs Group, Inc., 41.

³² Spielman, 48.

³³ Panchapagesan, Venkatesh. “Can Blockchain Solve Land Record Problems?” Livemint, 11 Apr. 2018, www.livemint.com/Opinion/t60KeJcJkuEkzU9hEC01GI/Can-blockchain-solve-land-record-problems.html.

regulations regarding land records in India, blockchain offers a strong solution for a problem that is plaguing the country, which is bound to help protect property rights for India's citizens.

Contrasting India to the United States, it is clear that the benefits of blockchain technology are not as important for U.S. land records. Generally, land records in the U.S. are well maintained due to the strong processes and systems that state governments have in place. There is not a critical need in the United States to use technology to protect the state of our land records as there is in India. Without this need, it is important to determine whether a blockchain model would be best for our land registries.

Additionally, despite technological advancements, human oversight and review will continue to be a necessary component of many transactions, particularly in the real estate industry. Even if blockchain technology is embraced for land registries, there will continue to be property title defects that only skilled professionals can resolve. Issues that arise due to faulty foreclosure actions, failure to properly record documents, and title contests brought by heirs of prior owners are all scenarios which require the knowledge and curative abilities of title professionals.

Ultimately, blockchain technology will not be able to do the work that title insurance professionals do each and every day, which is to provide peace of mind, protect property rights, and pay title policy claims. Homeowners and lenders have relied on the services of the title insurance and settlement industry for generations, and it is clear that emerging technologies will not replace the assurances that title insurance provides.

AUTHORS

Ashley Sadler, Esq.

Business and Compliance Strategist
ASadler@catic.com

Zachary Kammerdeiner, Esq.

Sr. Business and Compliance Strategist
ZKammerdeiner@catic.com

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