



SCHOOL OF LAW
TEXAS A&M UNIVERSITY

**Texas A&M Journal of Property
Law**

Volume 5
Number 3 *Student Articles*

Article 4

6-1-2019

The New "Chain" of Title: How Blockchain Will Affect Land Title Research, Recordation, and Insurance

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Recommended Citation

Matt Koronczok, *The New "Chain" of Title: How Blockchain Will Affect Land Title Research, Recordation, and Insurance*, 5 Tex. A&M J. Prop. L. 401 (2018).

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THE NEW “CHAIN” OF TITLE: HOW BLOCKCHAIN WILL AFFECT LAND TITLE RESEARCH, RECORDATION, AND INSURANCE

By *Matt Koronczok*†

ABSTRACT

Blockchain has recently driven a financial revolution in the realm of virtual currencies, smart contracts, and escrow services. Over the last year, the technology has also been mentioned as a harbinger of change in real estate transactions and land title research. Speculation about the technology’s likely impact in various industries is more warranted in some instances than others. Goldman Sachs, for its part, has suggested that, like other industries which have benefitted from the transparency and efficiency of blockchain technology, the title insurance industry will experience a dramatic boost in the near future. This suggestion, however, fails to recognize both the efficiency already achieved by industry title plants and the extent of legal problems that arise during title research—very few of which blockchain holds promise of mitigating.

Public land titling offices, on the other hand, stand to gain significantly by adopting the technology. Because of blockchain’s decentralized and unalterable structure, the technology is useful for protecting records from natural disasters and government corruption. This Comment charts the real property legal issues that blockchain likely will and will not address. Developers and investors will find that understanding what blockchain can and cannot do for the real estate industry is crucial, because blockchain hype looms large and, as Bitcoin’s recently fluctuating prices prove, the way forward for blockchain investment can be uncertain.

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I. INTRODUCTION

As blockchain technology outstrips its reputation for supporting virtual currencies like Bitcoin and Ethereum, developers have started to use it to resolve problems associated with modern-day management systems and transactional networks.¹ From basic necessities like file storage and counterfeit prevention, to more complex matters involving securities trading and supply chain verification, blockchain has inspired the reconceptualization and restructuring of technological norms in almost every industry.² Due to its distributed and unalterable construction, blockchain has reinvented existing market infrastructures by eliminating the need for transactional intermediaries and for computer networks requiring central and back-up data servers. Proponents of blockchain suggest that notaries public, escrow agents, and large institutions which mediate commercial and financial transfers will fight to stay relevant as the technology grows more capable, more robust, and more popular.³

Blockchain enthusiasts have discussed potential uses of the technology in real estate transactions and title research for over a year now.⁴ This conversation grows with each passing month as several counties in the United States and countries throughout the world experiment with blockchain as a possible platform for keeping land title information. On this cutting edge, an ever-growing list of developing and developed areas of the world experiment with the technology, including Davidson County, Tennessee (Nashville),⁵ Cook County, Illinois (Chicago),⁶ Brazil,⁷ Honduras,⁸ Sweden,⁹ the United Kingdom,¹⁰ Russia,¹¹

1. Febin John James, *Popular Use Cases of Blockchain Technology that You Need to Know*, HACKER NOON (Jan. 31, 2018), <https://hackernoon.com/popular-use-cases-of-blockchain-technology-you-need-to-know-df4e1905d373> [https://perma.cc/ZW8A-QMAC].

2. Andrew Meola, *The Growing List of Applications and Use Cases of Blockchain Technology in Business & Life*, BUS. INSIDER (Sept. 28, 2017, 4:46 PM), <http://www.businessinsider.com/blockchain-technology-applications-use-cases-2017-9> [https://perma.cc/YT3C-WXXU].

3. Crosby et al., *Blockchain Technology: Beyond Bitcoin*, 2 APPLIED INNOVATION REV. 14 (2016).

4. See Emma Hollingshead, *Will Blockchain Technology Transform Real Estate?*, JLL (Sept. 6, 2017), <https://www.jllrealviews.com/trends/innovation/will-blockchain-technology-transform-real-estate/> [https://perma.cc/3LB7-KMNU].

5. Avi Spielman, *Blockchain: Digitally Rebuilding the Real Estate Industry*, MASS. INST. TECH. (Sept. 2016), <https://dspace.mit.edu/bitstream/handle/1721.1/106753/96945/0770-MIT.pdf?sequence=1> [https://perma.cc/QU8P-JKAC].

6. Ragnar Lifthrasir, *Permissionless Real Estate Title Transfers on the Bitcoin Blockchain in the USA!—Cook County Blockchain Pilot Program Report*, MEDIUM (June 28, 2017), <https://medium.com/@RagnarLifthrasir/permissionless-real-estate-ti>

Ukraine,¹² India,¹³ the Republic of Georgia,¹⁴ and Dubai—the most populous city of the United Arab Emirates.¹⁵ The Dubai Land Department, for example, committed to securing all of its title-related documents on a blockchain by 2020.¹⁶ The Dubai government views blockchain implementation as a way to gain confidence from global real estate investors and as a means of helping tenants keep track of their leases and utilities payments.¹⁷ Altogether, Dubai’s endeavor to become a “blockchain innovation hub” in the international sphere shows that the city, like many others throughout the world, has invested in blockchain as a tool not only for land transactions and titling, but also for public access to governmental records altogether.¹⁸

Despite general optimism surrounding the topic, however, title research often requires the trained eye of a legal professional. Does blockchain actually stand to reduce or eliminate this need in any

tle-transfers-on-the-bitcoin-blockchain-in-the-usa-5d9c39139292 [https://perma.cc/T9FC-HBFB].

7. Charles H. Miller, *Blockchain Land Records: 6 Countries That Are Testing the Technology As We Speak*, WALLET WKLY. (Nov. 7, 2017, 2:37 AM), <https://www.walletweekly.com/blockchain-land-records/> [https://perma.cc/QGW2-MABH].

8. Laura Shin, *The First Government To Secure Land Titles On The Bitcoin Blockchain Expands Project*, FORBES (Feb. 7, 2017, 9:52 AM), <https://www.forbes.com/sites/laurashin/2017/02/07/the-first-government-to-secure-land-titles-on-the-bitcoin-blockchain-expands-project/#2d1abb4d4dcd> [https://perma.cc/X7D3-R5DN].

9. Molly Jane Zuckerman, *Swedish Government Land Registry Soon to Conduct First Blockchain Property Transaction*, COIN TELEGRAPH (Mar. 7, 2018), <https://coiantelegraph.com/news/swedish-government-land-registry-soon-to-conduct-first-blockchain-property-transaction> [https://perma.cc/WXT9-4JQ3].

10. Imogen Jones, *Could a Blockchain Land Registry Be the Way Forward for England and Wales?*, LEXOLOGY (Apr. 17, 2018), <https://www.lexology.com/library/detail.aspx?g=4bb88e51-2268-4a15-8ff8-7d1eb77e8c5f> [https://perma.cc/2FFJ-8Z26].

11. Nikhilesh De, *Russia’s Government to Test Blockchain Land Registry System*, COINDESK (Oct. 20, 2017), <https://www.coindesk.com/russias-government-test-blockchain-land-registry-system/> [https://perma.cc/HZ78-3FRP].

12. Volodymr Verbyany, *Ukraine Turns to Blockchain to Boost Land Ownership Transparency*, BLOOMBERG (Oct. 3, 2017, 9:26 AM), <https://www.bloomberg.com/news/articles/2017-10-03/ukraine-turns-to-blockchain-to-boost-land-ownership-transparency>.

13. Sindhuja Balaji, *India’s Blockchain Revolution Goes Beyond Banks into Land Records and Private Firms*, FORBES (Dec. 28, 2017, 1:00 PM), <https://www.forbes.com/sites/sindhujabalaji/2017/12/28/indias-blockchain-revolution-goes-beyond-banks/#59ee52174123> [https://perma.cc/9UZ6-ECQ6].

14. Vladimir Smerkis, *Georgia Records 100,000 Land Titles on Bitcoin Blockchain: BitFury*, COIN TELEGRAPH (Apr. 20, 2017), <https://coiantelegraph.com/news/georgia-records-100000-land-titles-on-bitcoin-blockchain-bitfury> [https://perma.cc/RMS6-LVLM].

15. Marc Hochstein, *Dubai Land Department Launches Blockchain Real Estate Initiative*, COINDESK (Oct. 10, 2017, 11:04 UTC), <https://www.coindesk.com/dubai-land-department-launches-blockchain-real-estate-initiative/> [https://perma.cc/52Y3-ZY8W].

16. *Id.*

17. *Id.*

18. *Id.*

way?¹⁹ Goldman Sachs and others have estimated that blockchain may reduce the burden of researching title, which currently drives up the cost of premiums in the title insurance industry. Time spent researching title, a Goldman Sachs report explains, acts as a source of friction in real estate markets because of its time-intensive nature.²⁰ Can blockchain streamline the industry's current title plant research process enough to bring down insurance prices? Will a more accessible and transparent platform for public land records reduce the demand for title insurance altogether?

This Comment will first discuss blockchain as it is used apart from implementation in virtual currencies. Typical title research problems are then discussed, and a case study of a recent blockchain-based real estate solution is analyzed. Blockchain's likely influence on the future of title insurance is then discussed, and finally, a few legally practical uses of blockchain are offered.

II. WHAT IS BLOCKCHAIN?

"Blockchain" is the word used to describe blockchain technology in general. As of 2018, multiple "blockchains" exist, including the Bitcoin blockchain, the Ethereum blockchain, and countless other, smaller blockchains, which are used for a variety of purposes. Essentially, a blockchain is a digital protocol that enables the creation of an unalterable, decentralized distributed ledger across a public or private network.²¹ In many network protocols, individual computers ("nodes") on the network transfer data to other computers by passing it first through a central server. In contrast, blockchain protocols allow each node to communicate directly with all other nodes via a set of rules for sharing and storing information, which all nodes in the network adhere to by virtue of accessing the blockchain network.²²

The process is simple, but revolutionary: when one node uploads information to a blockchain network, that information is stored in a digital container called a "block," which is saved directly in every other node on the network.²³ Once each node has saved the block, each node creates a digital fingerprint called a "hash" for its particular copy of the document.²⁴ The hash is based on the document's contents, and will change if those contents are altered in any way. Each

19. Teke Wiggin, *Blockchain Could Jolt Real Estate and the Title Industry in 2017*, INMAN (Jan. 3, 2017), <https://www.inman.com/2017/01/03/blockchain-could-jolt-real-estate-and-the-title-industry-in-2017/> [<https://perma.cc/AVF9-5BT9>].

20. James Schneider et al., *Blockchain: Putting Theory into Practice*, GOLDMAN SACHS 36 (2016), <https://msenterprise.global.ssl.fastly.net/wordpress/2017/07/Goldman-Sachs-Blockchain-putting-theory-to-practice.pdf> [<https://perma.cc/PYM7-RS5E>].

21. Ronald L. Chichester, *Wide Open Spaces*, 80 TEX. B.J. 228, 228 (2017).

22. *Id.*

23. *Id.* at 229.

24. *See id.* at 228 (great diagram explaining blockchain's "hashing" features).

node continuously verifies the hashes belonging to every other node's copy of the document, to ensure that no node's version of the document has been changed. As new documents are added to the network, an unalterable chain of blocks (i.e. a “blockchain”) is formed, with each block being time-stamped and linked to the previous one by additional hashes. The history of information stored in the blockchain irreversibly connects to the initial “parent” block and is stored in part or in its entirety on each computer in the network. A blockchain protocol, then, has the effect of creating a distributed ledger which neither network users nor middlemen can alter or delete, and which is transparent to all parties with access to the network.

Real estate futurists have not overlooked the potential advantages of a distributed ledger that eliminates risk of fraud and supersedes time-consuming third-party verification processes. Two primary ideas of how to implement blockchain in real estate have emerged, along with the thought that the two will someday merge into a single reality. The first idea is to use blockchain to support real estate transactions in the form of smart contracts. The second idea is to use blockchain as a platform for keeping land titling information.

Smart contracts are self-executing contracts that exist on a blockchain. Entrepreneurs have developed creative ways to represent real-world assets in digital form so that a person can transfer property interests over a smart contract with relative ease.²⁵ These programmers add a layer to the existing blockchain interface, so that potential buyers can view verification documents for the property interest they are purchasing. This verification process ensures potential buyers that the purchased interest is actually linked to a real-world asset, like personal property, a commodity, or even a building. The property interest is treated like a virtual coin by the blockchain, but the added layer of real world verification “colors” the coin and ensures an asset is attached to it. When potential purchasers can confirm that the property actually exists (and has not been damaged, say, in a house fire), property interests can be traded via blockchain in direct exchange for a virtual currency without the transaction ever leaving the blockchain. Smart contracts create new real estate investment possibilities by automatically executing and carrying out deals with partners around the globe.

The second way to implement blockchain in real estate includes using it as a platform for keeping land titling information. By keeping relevant chain-of-title documents on a blockchain, government offices will have an organized, efficient, and unalterable system of accessing and adding property records to a publicly shared database. This Com-

25. For a brief video explanation of the “colored coin” system of exchange, for example, see Decentralized Thought, *Bitcoin Cash Colored Coins: Simply Explained*, YOUTUBE (Jan. 22, 2018), <https://www.youtube.com/watch?v=889JSfIaPzs&feature=youtu.be>.

ment will treat the topic of blockchain and land titling in great depth, so it is unnecessary to discuss it here. It is worth noting, however, how the two ideas—smart contracts and blockchain-based land titling—are expected to work together. Blockchain enthusiasts predict that when public land titling records become sufficiently blockchain-compatible, then buyers and sellers will be able to use blockchain to execute smart contracts, convey property interests, and record those interests with the public land titling office, all within a few minutes, and without need for traditionally necessary third parties like notaries public, escrow agents, trustees, loan officers, or deed records clerks.

From a legal perspective, blockchain is likely to live up to the bright future its real-estate-minded developers have begun to create for it; but *how* this success unfolds will likely differ from the picture painted in popular discussions. We will leave aside the complex matter of blockchain smart contracts in this Comment and discuss instead the benefits and shortcomings of blockchain in a public land titling and title insurance capacity. The next Section of this Comment will outline common legal problems potential buyers are likely to encounter when researching title to a piece of property and will analyze how the introduction of blockchain technology into land titling may or may not mitigate those problems.

III. TYPICAL TITLE RESEARCH PROBLEMS AND A BLOCKCHAIN SOLUTION

State of title is crucial in a land sale. An unsophisticated buyer of a piece of land may recognize only two or three parties with an interest in the land's state of title—himself, the seller, and perhaps the person loaning him purchase money. In reality, however, many other parties take an interest in the land's chain of title as well, including people who hold an easement across the property; people who have previously entered into a real covenant with the owner of the land; will beneficiaries; trust beneficiaries; people who have secured or hope to secure a lien against the land; tax assessors; common carriers; future lenders; and various government agents at the neighborhood, city, county, state, and federal level. The legitimacy of each party's claim or potential claim on that piece of land will live or die by the land's current state of title. Does blockchain offer buyers, sellers, and other interested parties any advantages in the miasmatic legal task of conducting title research? As we will see, the land-owning and land-purchasing public stands to gain from the new level of land-records accessibility made possible by a blockchain platform. It is not obvious, however, that blockchain will mitigate the more difficult problem of researching title in a thorough or efficient manner. As such, title insurance may become no less expensive and no less commonly used.

A. *Typical Title Research Problems*

Some of the most time-consuming work title researchers undertake involves tracking down unrecorded interests of various kinds, which may, although unrecorded, be nonetheless effective against a buyer.²⁶ Title research requires meticulous confirmation, for example, that fiduciaries have carried out the details of their responsibilities regarding retention or disposition of land.²⁷ A researcher must confirm that necessary court orders were obtained and must establish evidence that sales conformed to the requirements of documents and statutes.²⁸ Confirmation of appropriate dispersal of any resulting proceeds is also necessary.²⁹ Additionally, researchers must conduct an investigation of conditions on the land which may constitute notice even though not recorded—including conditions that give “constructive” or “inquiry” notice of easements, leases, or hostile claims of ownership in the land.³⁰

Creating additional problems, deeds often fail to contain references to former owners or to earlier deeds in which the same property may have been differently described.³¹ The title searcher finding this situation is left to rely on evidence ranging from modern tax records to the memories of those who might recall the details of prior, sometimes dead, owners’ lives and dealings. The possibility for error in establishing the chain for the requisite period and for examining the acts of each owner for the time required is thus very high.

A similar recording difficulty is the problem of interests recorded before or after the time the record shows transferors to have ownership. Indeed, instances of a “deed recorded too early”³² or a “deed recorded too late”³³ may cause title to fail when a bona fide purchaser takes the property unaware of those deeds.³⁴

Other unrecorded title issues may derive from unadministered estates or improperly administered estates; name changes through marriage, adoption, error or otherwise; possibilities of large numbers of tenants in common, especially in cases of large families with several generations of intestate deaths and unadministered estates;³⁵ marital

26. For an eye-opening, 57-page catalogue of potential off-record title defects, see Ralph L. Straw, Jr., *Off-Record Risks for Bona Fide Purchasers of Interests in Real Property*, 72 DICK. L. REV. 35 (1967).

27. *Id.* at 74.

28. *Id.*

29. *See id.*

30. *Id.* at 67–68.

31. *Id.* at 80.

32. *See, e.g.*, Breen v. Morehead, 136 S.W. 1048 (Tex. 1911).

33. *See, e.g.*, Segal v. Saunders, 220 S.W.2d 339 (Tex. Civ. App.—Fort Worth 1949, writ ref’d n.r.e.).

34. *See Sw. Title Ins. Co. v. Woods*, 449 S.W.2d 773 (Tex. 1970) (a “wild deed”).

35. *Id.* at 60.

rights flowing from either common law or statute;³⁶ the incompetency or unscrupulousness of past owners; and wills with vague or difficult to manage conditions that may shift estates on virtually as many contingencies as the mind can conjure. And no list of potential title defects is complete without mentioning third-party claims like tax liens, judgment liens, and expired or unfiled mechanic's and vendor's liens.³⁷ Adverse possession, prescriptive easements, and implied easements create similar unrecorded third-party interests.³⁸

The sheer number of unrecorded interests which may exist in any given piece of land is enough to scare buyers and title lawyers alike into the arms of insurers. Determining property's chain of title is always a serious matter, even when it is a relatively simple search. A defect in title after signing a purchase contract can result in the buyer losing both his purchase money and his new property.

B. *A Blockchain Solution—Cook County, Illinois*

Blockchain will not likely eliminate the myriad of unrecorded title defects that might exist in a purchased piece of property, but it may improve the public's ability to recognize potential defects without the help of a legal professional. In a recent example of this, the Cook County Recorder of Deeds (“CCRD”) in Chicago, Illinois initiated a Pilot Program (“Program”) to study how Cook County's land recordation system could implement blockchain technology.³⁹ Specifically, CCRD intended to create a database that could be used by unwitting buyers of real property to ensure the property was not encumbered by one of the many impediments to title that are not ascertainable by inspection of the property alone.⁴⁰ The idea for such a database arose in the midst of a larger problem Cook County had been experiencing, in which “contract for deed” schemes were becoming common, where fraudsters sold to purchasers property that could not be legally acquired or inhabited without first correcting a defect of some sort or another.⁴¹ The results of the Program, published on May 30, 2017, describe the benefits of using blockchain for keeping public land records.

CCRD began by creating an all-encompassing database for storing information about each piece of land in the county, including information from at least five different county offices.⁴² The database took

36. *Id.*

37. *Id.* at 58.

38. *Id.* at 64.

39. *Blockchain Cook County*, COOK CTY. RECORDER DEEDS, <http://cookrecorder.com/blockchain/> [<https://perma.cc/V4Z7-UPAD>] (last visited Aug. 16, 2018).

40. *Id.* at 26.

41. *Id.*

42. John Mirkovic, *Blockchain Pilot Program: Final Report*, COOK CTY. RECORDER DEEDS 36–37 (May 30, 2017), <http://cookrecorder.com/wp-content/uploads/2016/11/Final-Report-CCRD-Blockchain-Pilot-Program-for-web.pdf> [<https://perma.cc/6U9E-QADV>].

several months to create, requiring a software firm to copy all of Cook County’s 190 million existing records to servers, converting and watermarking each record into PDF form, and aligning each record to CCRD’s prior indexing data.⁴³ After all of the records were transferred, the firm began plugging in trusted data sources to build a digital property abstract for every land parcel in the county. The firm utilized blockchain technology to create a chain of title for each property, hashing every pertinent recorded document in the chain, so unauthorized changes in the documents would be noticeable. The software firm then added to the digital property abstract each parcel’s tax assessment attributes, such as lot size and square footage, from the tax assessor’s office, its property tax payment and appeal history from the Tax Treasurer’s office, a GIS satellite map of the parcel from the County Clerk’s office, existing Chicago building permits and violations from the City of Chicago, latitude and longitudinal satellite coordinates from the United States Census, and a photo from Google maps.⁴⁴

Following the addition of new information, the software firm then created a tool for visualizing the data, called “Property Health.”⁴⁵ Property Health “allow[ed] interested investors or aspiring homeowners to see at a glance any issues that may prevent acquisition of the property.”⁴⁶ The new visualization used simple yes/no logic and color coding (red/green) to indicate whether a property possessed worrisome characteristics. Properties sold for unpaid taxes, properties subject to Chicago building code violations, properties subject to pending legal actions (e.g., foreclosures), or properties on the Chicago Demolition List caused an ordinarily Green box in the Property Health visualization to turn Red. This would warn potential buyers to inquire further into the property before purchasing it.⁴⁷

CCRD’s blockchain-based Property Health visualization informed potential buyers of basic impediments to acquiring good title—pending litigation, pending demolition, outstanding liens, and city code violations. It offered increased notice of potential title problems to potential buyers in the public, and for this reason, CCRD renders rightful praise to blockchain technology. The visualization stopped short, however, of analyzing actual chain of title, offering instead a rudimentary “glance” at potential problems. Recalling potential title defects mentioned in the previous Section,⁴⁸ one might imagine several defects that would remain hidden from a user of the Property Health tool. Not to mention defects that might be impossible to de-

43. *Id.*

44. *Id.*

45. *Id.* at 28.

46. *Id.*

47. *Id.*

48. *See* Straw, *supra* note 26.

tect, which may nonetheless arise no matter how thoroughly the buyer examines title, including forged instruments,⁴⁹ fraudulent releases,⁵⁰ issues surrounding the mental or legal capacity of a grantor,⁵¹ lack of essential formality in the execution of prior deeds (delivery and acceptance),⁵² and subsequently discovered wills.⁵³

Blockchain is a technology for distributing information. Distributing information about potential legal impediments to purchase is a good thing, not least of all because it may put buyers on notice of potentially adverse claims to a piece of property. Nonetheless, having access to information does not guarantee a reasonable interpretation of that information. An all-green “health” report may create unwarranted confidence in title which is, in reality, burdened by one or more less-noticeable defects. An incautious deed records office might even expose itself to liability by allowing public confidence to go unchecked. Propagating public title information serves a great public interest by increasing transparency in real estate markets. But it will also create a different relationship between the public and land title records, where the public is more aware of what the records *say*, but is hardly closer at all to understanding what they might mean. The implications of this evolving relationship between market actors and land title records are not clear, but the change may affect both transactions and insurance.⁵⁴

IV. BLOCKCHAIN AND TITLE INSURANCE

Title insurance premiums are a sizeable cost in any real property transaction, running between \$1,000 and \$1,800 on average, which represents 0.4% to 0.6% of home value, assuming a \$275,000 property.⁵⁵ Goldman Sachs has projected that blockchain will bring dramatic changes and cost savings to the title insurance market, into which \$11 billion in premiums was paid in 2014.⁵⁶ Goldman Sachs’ contention is that, because the cost of title insurance premiums is driven up by the extensive amount of title research required by the underwriting process, an introduction of blockchain into title research practices “could meaningfully lower transactional risk associated with the existing property registration system in the United States, intro-

49. *Id.* at 39.

50. *Id.*

51. *Id.* at 50.

52. *Id.* at 54.

53. *Id.* at 75.

54. *See, e.g.,* Nuria Martindale, *Changing the Face of Title Insurance: The Next Generation*, NOVATION TITLE INS. AGENCY (Feb. 1, 2018), <http://novationtitle.com/changing-the-face-of-title-insurance-the-next-generation/> [https://perma.cc/HEX3-TNYA] (listing “improving transparency” and “educating consumers” as values for title insurers to keep in mind as technology progresses).

55. Schneider et al., *supra* note 20, at 34.

56. *Id.* at 33.

ducing significant cost efficiencies that would benefit the end consumer.” The bank predicts that over the long term blockchain could bring title insurance premiums down by two to four billion dollars annually by requiring “substantially less manual labor [from insurers] . . . to examine and ‘cure’ property title records.”⁵⁷ With the help of blockchain technology, Goldman Sachs suggests, many of the industry’s abstractors, curators, and attorneys currently involved in the underwriting process will become obsolete.

Before contending with that analysis, the Author would like to note that blockchain may not be coming to land title recording offices as soon as Goldman Sachs thinks. Rather, property recordkeeping professionals seem more concerned with the implementation of Geographic Information System (“GIS”) technology than with blockchain usage. For example, the Property Records Industry Association (“PRIA”) is a group formed by Fannie Mae and the American Land and Title Association in 2002 that provides “a forum for the identification, research, discussion, development, drafting, and implementation of national standards, best practices, and new technology solutions to promote the integrity of the public records system, the efficiency of industry operations, and the effectiveness of interfaces between the two.”⁵⁸ PRIA is a nationally-recognized industry player in public land records management.⁵⁹ PRIA has published its most recent white papers on how to integrate current (that is, non-blockchain-based) land records management systems with GIS technology.⁶⁰ As of January of 2018, the PRIA website and resources page do not mention blockchain even once. Rather, the website’s homepage displays a banner that reads “1,856 Counties Now eRecording!”⁶¹ Based on this data alone, the Author suggests that in the coming years property records managers in America’s 3,141 counties⁶² will more likely worry about moving public records from print into computer databases rather than worry about implementing publicly-accessible blockchain networks. Likewise, counties which already use an electronic records database may focus more on integrating GIS than they will on finding uses for

57. *Id.* at 36.

58. *PRIA History*, PROP. RECS. INDUSTRY ASS’N, <https://www.pria.us/i4a/pages/index.cfm?pageID=3870> [<https://perma.cc/L5F9-B24F>] (last visited Aug. 22, 2018).

59. *Id.*

60. *GIS and Land Records Integration*, PROP. RECS. INDUSTRY ASS’N 4 (2017), https://www.pria.us/i4a/doclibrary/getfile.cfm?doc_id=170 [<https://perma.cc/VU3K-GYCD>].

61. *PRIA’s Vision*, PROP. RECS. INDUSTRY ASS’N, <https://www.pria.us/i4a/pages/index.cfm?pageid=1&activateFull=false> [<https://perma.cc/QS56-3CZ6>] (last visited Sept. 1, 2018).

62. *How Many Counties are There in the United States?*, U.S. GEOLOGICAL SURV., <https://www.usgs.gov/faqs/how-many-counties-are-there-united-states> [<https://perma.cc/6QRC-MAKH>] (last visited Sept. 1, 2018).

blockchain.⁶³ Nonetheless, this Section will address the possible effects of blockchain on title insurance.

A. *Modern Title Plants*

For the counties in the near future that will actually consider blockchain as a land records management priority, it remains to be seen whether Goldman Sachs' predictions about title plant efficiencies and industry premiums will come true. A title plant is a compilation of all instruments of record that may impact title to real property. Title plants consist of indices and images of all instruments filed within a jurisdiction, and information from tax records, court records (criminal, civil, probate, family, bankruptcy, or otherwise), maps, plats, prior abstracts, and prior attorney opinions. In Texas, a title plant must (1) be geographically arranged; (2) cover a period beginning not later than January 1, 1979, and be kept current; and (3) be adequate for use in insuring titles, as determined by the Texas Department of Insurance.⁶⁴ Regulation by state statutes is important because title plants are central to title abstracting and insuring. By offering geographic searching efficiency, a single-platform search process, and a collection of starter files, title plants result in lower operating costs, reduced risks, and fewer policy claims for title companies. They also provide insurers with the means to enhance and correct the public land record by bringing errors to the recorder of deeds' attention and requiring potential buyers to correct clouded title before extending an offer to insure.⁶⁵

Title plants improve search efficiency and risk management by aggregating, integrating, and standardizing data, by providing for multiple layers of data verification, and by collating data for a more searchable database.⁶⁶ Like county records, title plant records are searchable by indices of geographic location and by the owner's name.⁶⁷ Records at a title plant are also searchable by subdivision, parcel, and Appraisal Review Board ("ARB") Number—a unique parcel identifier for Section Land, used in the United States Public Land Survey System.⁶⁸ The data in a title plant is entered internally,

63. *But see* Arup Dasgupta, *The Game Changer of Geospatial Systems—Blockchain*, GEOSPATIAL WORLD (Sept. 22, 2017), <https://www.geospatialworld.net/article/blockchain-geospatial-systems/> (describing a technological development called "FOAM" which "ties together geospatial and Blockchain" by creating a system in which movement of goods can be traced and delivery costs calculated and debited (via virtual currency) automatically).

64. TEX. INS. CODE ANN. art. 2501.004 (West 2009).

65. David Floyd et. al., *Title Plants 101*, PROP. RECS. INDUSTRY ASS'N (Feb. 27, 2013), <http://www.pria.us/files/public/Conferences/Winter/2013/title%20plant%20101%20Version%208.pdf> [<https://perma.cc/4CUC-2PFD>].

66. *Id.*

67. *Id.*

68. *Id.*

based on source images gathered from recorder indices, tax assessor data, court proceedings, and various other sources.⁶⁹ The title plant’s information is verifiable due to cross referencing and comparison of multiple data sets on a single property. Parcels are validated through GIS mapping software, and searches can be stretched across multiple counties. Title chains are searchable, and much of the data is automated and integrated into the searches. Title plants also keep track of mining claims, acreage, mineral rights, fraud alerts, and even terrorist watch lists.⁷⁰ Title plant software often reports errors to its users and provides a succinct title evidence audit for underwriters.⁷¹ Title plants are efficient and thorough because it is in a title insurer’s best interest to search title as quickly and effectively as possible.⁷²

B. *Blockchain and Title Insurance*

In light of claims made by Goldman Sachs and others, one might wonder whether blockchain can somehow render the underwriting process more efficient for title insurers when title plants are already designed for maximum information integration and research efficiency. Blockchain optimists offer no explanation of why, nor is it entirely obvious *how*, enhanced efficiency would occur. Nonetheless, when smart contracts grow popular enough, and automatic recording on public records blockchains become a real possibility, the title insurance industry will undergo unpredictable sea changes. In that future, private title plants may become obsolete in comparison to a system of blockchain-backed public records, which will update quickly and accurately with each conveyance. As the next generation of records management technology comes forward, unwary insurers may fail to adjust their pricing and business models to reflect the public’s changing relationship with land records. These insurers will find themselves in an awkward relationship with blockchain technology, in which land records will be more accessible to buyers and sellers, but not any more discernible to them without a professional opinion or legal training. Nevertheless, one may wonder—could blockchain-based title records drive title insurance into extinction? The next Section will discuss why blockchain will likely never resolve the need for title insurance altogether.

V. THE REMAINING PROBLEM OF INDEMNITY

Regardless of the type of land titling system used in a jurisdiction, the legal need for title research and title insurance will remain when

69. *Id.*

70. *Id.*

71. *Id.*

72. See Lawrence J. White, *The Title Insurance Industry, Reverse Competition, and Controlled Business—A Different View*, 51 J. RISK & INS. 308, 310 (1984).

public records become more accessible to the public. Two main types of land titling exist in Western societies today—recordation and registration. Recordation, the system used in all but a few American counties, is a system in which the government maintains a public records office where the public openly files documents relating to property conveyances. In recording systems, courts decide good title only when a case or controversy arises. Registration systems, on the other hand, attempt to avoid litigation by allowing a government-maintained records office to determine ownership of a property and issue a certificate of title to owners so determined. The most common form of registration system is the Torrens system. Most countries seeking blockchain implementation in their land titling offices utilize some form of registration system. This means that indemnity may work differently in other countries than it does in the United States, where title insurance is common. This Section will discuss how blockchain does not affect the need for indemnity in either system.

A. *Recording Systems*

In most counties throughout the United States, land titling is based on recording systems similar to the type first used in the Massachusetts Bay Colony in the 1600s.⁷³ In a recording system, private actors present documents which may affect title to real estate to government offices for recordation. Recording is typically not a prerequisite to the legal validity of a document.⁷⁴ Deeds, wills, and other properly executed instruments may create interests in property even if they are not recorded.

Furthermore, the acceptance of an instrument for recordation does not usually reflect a governmental judgment that the instrument is legally effective.⁷⁵ Instead, the government is merely a depository of copies of the instruments so that parties who wish to evaluate recorded documents may have access to them. In this respect, recordation facilitates real estate transfers by giving prospective transferees information relevant to determining ownership.⁷⁶

Generally, recording systems use either grantor-grantee or tract indices to locate recorded documents. Locating all of the relevant recorded documents can be extraordinarily difficult using indices. The oldest and most common index for managing copies of recorded instruments is the grantor-grantee type.⁷⁷ In this type of index, instru-

73. 4 THOMAS E. ATKINSON ET AL., *AMERICAN LAW OF PROPERTY: A TREATISE OF THE LAW OF PROPERTY IN THE UNITED STATES* 527–29 (A. James Casner ed., 1952).

74. ATKINSON ET AL., *supra* note 76, at 549.

75. ATKINSON ET AL., *supra* note 76, at 614.

76. THOMAS W. MAPP, *TORRENS' ELUSIVE TITLE: BASIC LEGAL PRINCIPLES OF AN EFFICIENT TORRENS' SYSTEM* 49 (1978).

77. BURKE ET AL., *FUNDAMENTALS OF PROPERTY LAW* 605 (1999).

ments are indexed alphabetically according to the grantors' and grantees' surnames. Title searchers use the grantee index to reach back into time to establish the chain of owners, and they use the grantor index to find adverse, recorded conveyances each grantor made while owning the interest in question. The grantor-grantee type of index is relatively easy and inexpensive for governments to administer, but the index is normally difficult to use. Furthermore, where a past transfer of title does not appear in the grantee index, the title searcher may have to guess how ownership passed to an owner in order to reach further back in time where additional transactions may be recorded. If a particular transaction does not appear in the grantee index, the searcher is limited to the process of trial and error and may or may not be able to discover how ownership passed to a particular owner.

The tract type of index⁷⁸ is easier to use but is more difficult and expensive for governments to maintain. Tract indices organize instruments according to the property they affect. Instruments affecting each segment of land are indexed on a page or set of pages for that parcel. Modern government-owned and privately-owned tract indices utilize software based on GIS mapping technology, which furnishes digitized documents related to the parcel in a few clicks.⁷⁹ Recording office employees must be able to identify the proper segment of the index in which to reference instruments, usually from the legal descriptions appearing on each instrument. This process requires more time, money, and a higher level of expertise than is the case with a grantor-grantee index. In states without official tract indices, government or private title companies sometimes maintain unofficial tract indices.

The recording system does not provide conclusive security of real estate ownership because there is no guarantee that the record of ownership for a piece of land reflects its actual state of ownership.⁸⁰ A recorded, apparently valid conveyance may be void or defective. Unrecorded interests that are discoverable by physical inspections or inquiries may be valid under the common-law doctrines of constructive notice and inquiry notice.⁸¹ Furthermore, some unrecorded interests may be valid even if they are not discoverable by such inspections or inquiries.⁸²

The need for title insurance in recording jurisdictions is well known and is often considered a great flaw in recordation-based systems be-

78. *Id.* at 608–09.

79. See *Land Records*, ARCGIS FOR LOC. GOV'T (2018), <http://solutions.arcgis.com/local-government/land-records/> [<https://perma.cc/ZM8U-RE8A>] (discussing a GIS product commonly used by land records offices).

80. See generally Harry M. Cross, *Weaknesses of the Present Recording System*, 47 IOWA L. REV. 245 (1962) (discussing the deficiencies in the recording system).

81. ATKINSON ET AL., *supra* note 76, at 565.

82. *Id.* at 565–66.

cause of the additional closing costs imposed upon purchasers, who are typically required by their mortgagees to secure a title insurance policy before the mortgage loan will issue. The possibilities for failure of title in a recording jurisdiction are almost endless, as this Comment has already outlined.

B. *Registration Systems*

Unlike recording, title registration does not usually create or transfer a legal interest until government itself makes a conclusive assessment of the current state of the title. While title registration has been used in Continental Europe since the early Middle Ages, modern European title registration systems were not established until the 1800s.⁸³ One of the most popular types of title registration used around the world is called the Torrens system.⁸⁴ Today, states with limited implementation of a Torrens-like system include Minnesota, Virginia, Massachusetts, Colorado, Georgia, Hawaii, New York, North Carolina, Ohio, and Washington.⁸⁵

In some registration systems, the conveying parties are required to secure their own forms of title insurance.⁸⁶ Title insurance companies operate in these jurisdictions in a manner similar to title insurance companies in recordation models, conducting title research and charging premiums based on the risks associated with the property and the cost of underwriting.⁸⁷ In other registration jurisdictions, the government itself indemnifies title, in which case a guarantee against defective title looks much different than it does in recordation systems because the taxpayer bears the cost of underwriting—and ultimately, paying—a claim.⁸⁸ One surprising fact for someone accustomed to recording systems is that registration systems require indemnification at all—why would insurance be necessary if a government registry office has proffered a stamp of approval guaranteeing good title to an apparent, designated holder? Does the new owner not hold title free and clear against all previous claims?

The truth of the matter is that when a land registry declares good title, “exceptions” to the declaration exist. These exceptions can be either statutory or judge-made. Based on these exceptions, some

83. See generally ERNEST DOWSON & V.L.O. SHEPPARD, *LAND REGISTRATION* (3d ed., 1968).

84. RUSSELL C. BRINKER & ROY MINNICK, *THE SURVEYING HANDBOOK* 896 (2012).

85. Shaun Watchie Perry, *Outline of the Torrens Act*, 1 GP SOLO L. TRENDS & NEWS 4 (2005), https://www.americanbar.org/content/newsletter/publications/law_trends_news_practice_area_e_newsletter_home/torrenact.html [https://perma.cc/J9P V-T24D].

86. See John L. McCormack, *Torrens and Recording: Land Title Assurance in the Computer Age*, 18 WM. MITCHELL L. REV. 61, 108 (1992).

87. *Id.* at 78–79.

88. *Id.* at 93.

scholars have concluded that a land registry is less conclusive than it initially seems. The exceptions to a registry’s declaration of title fall into eight categories: caveats, governmental interests, private special interests, possessory interests, equitable interests, error exceptions, encroachments, and non-title related restrictions on ownership or use.⁸⁹ Each of the eight exceptions is summarized below.

Caveats⁹⁰ are notices on certificates of title indicating possible claims that have not been technically registered because of pending circumstances. A caveat is typically reserved for situations where the validity of an interest is being litigated or is otherwise in a process of being legally determined. When a claimant files a caveat against a property, the claimant reserves that interest against potential future takers of title. In this sense, caveating is a form of recording within the registry because the government makes no statement about the validity of the claim. Instead, a caveat puts subsequent purchasers on notice of a potential claim.

Governmental interests⁹¹ include governmental rights under federal law, liens, or similar interests which ensure the collection of taxes, and governmental access to utilities, streets, highways, etc. The government’s claims may take precedence over the title registry depending on the laws of the jurisdiction. Private rights arising under federal law may also take precedence over the registry, such as a creditor’s rights to the real property in a federal bankruptcy proceeding.

In some land registry systems, private special interests such as judgement liens and orders⁹² of attachment are valid against the land registry—even when these liens were not properly caveated on a certificate of title. Other jurisdictions have created a statutory mechanic’s lien exception, which can also become an off-certificate risk.

Possessory interests⁹³ may also cause a defect in title in registry systems. Such interests include short-term, undocumented leases; active but unregistered implied right of way easements; and adverse possession claims. The recognition of possessory interests in a registry system makes physical inspection of the premises imperative, even when one holds a valid certificate of title.

Furthermore, equitable interests⁹⁴ may exist in a property by the operation of due process, notice, and other rights-based requirements. Such interests are most commonly created when a transferee is guilty of fraud or when a person who should have been joined as a party to the registration was omitted. Title may change as to fraudsters or persons left behind long after a property has been registered.

89. *Id.* at 90–91.

90. *Id.* at 91.

91. *Id.* at 92–93.

92. *Id.* at 93–94.

93. *Id.* at 94–95.

94. *Id.* at 95.

Exceptions for administrative errors⁹⁵ can also cloud the conclusiveness of a title certificate. If the registrar erroneously issues more than one certificate for the same real estate interest, a situation may arise that is similar to the competing chains of title problem encountered under recording. In this situation, courts have held that the earliest certificate prevails. Torrens insurance funds are generally available to compensate those suffering losses from such errors.

Encroachment upon a piece of property by structures situated on neighboring land⁹⁶ is an off-the-record risk in recording systems and an off-the-certificate risk in registry systems. Under both forms of governance, encroachments can always represent a real defect to title. The best way to protect a piece of property against them, of course, is to purchase or examine a current property survey.

Finally, restrictions on property due to land use laws and regulations⁹⁷ often affect a property in ways not reflected in county records or on a title certificate. Restrictions take the form of local, state, and federal planning, zoning, building, and environmental laws.

Land registry systems provide less security of title than an unfamiliar reader might expect. Of course, these exceptions do not preclude the argument that a registry-based system remains more reliable and secure than a recording-based system. Even in a land registry system, however, the need for title insurance of some kind remains necessary.

C. *Blockchain and Indemnity*

One might imagine a blockchain-based registry system that organizes relevant chain of title documents to streamline the government's title searches. But the legal analysis involved in recognizing potential issues in title-related documents requires, in both registration and recordation systems, a legally trained title searcher. Moreover, both registration and recordation systems require some source of indemnification for defects that might arise despite a thorough searching and curing period. This is even true for government-indemnified registries, in which one title research misstep can cost the public significant tax dollars.

Going forward, blockchain advocates should recognize that blockchain creates new possibilities for organizing and decentralizing information, but will not likely eliminate the need for time-intensive research and insurance. As mentioned before, a large-scale implementation of a blockchain-based public records system may even lead to a false confidence on the part of the consumer, who does not realize the legal complexities involved in examining title—in either a recording

95. *Id.* at 96.

96. *Id.* at 97.

97. *Id.*

or registry system—and who may end up with defective title to a property, resulting in devastating monetary losses.

VI. CONCLUSION: THE FUTURE OF LAND TITLING

While blockchain holds promise for making land records more accessible to the public and more resistant to fraud, corruption, and natural disaster, it will unlikely streamline title research for insurers, who already have access to well-organized and collated title plants. The most time-consuming aspect of title research does not involve finding and accessing previously recorded documents, which is what a blockchain platform for land records would streamline. Rather, it involves recognizing when an unrecorded interest might exist, tracking down unrecorded interests, tracking down other information when a recording error misstates it or omits it, finding deeds recorded too early or too late, making sure third party claims have been properly disposed of, and examining the property itself, to discover circumstances which might put a buyer on constructive notice of an encumbrance or adverse claim.

The question remains, then: where in the real estate world will this powerful new technology likely make its biggest splash? Promising prospects might be found in the regions of the world that currently have little or no access to land titling.⁹⁸ Roughly 70% of the world’s population currently lacks access to proper land titling.⁹⁹ Economic localities struggle to thrive without a dependable system of land titling because it is difficult to identify the true owner or rightful possessor of any given property.¹⁰⁰ In those jurisdictions property owners have difficulty selling their land or leveraging it as security on a loan because proof of ownership can be difficult or impossible.

Countries that currently have no land titling system may lead the way with blockchain-based systems because these countries do not face the problem of deciding whether to switch from an older system. To these countries, blockchain will offer two benefits that other forms of electronic filing will not: preventing corruption and protecting against natural disasters. Because of blockchain’s resistance to alteration and deletion, the technology may solve the problem of land

98. See generally Tony Lamb, *Systematic Property Registration: Risks and Remedies*, WORLD BANK (May 2016), <http://pubdocs.worldbank.org/en/870621470748209208/FINAL-WEB-Title-Registration-Toolkit.pdf>.

99. Jonathan Keane, *Why Sweden is Taking a Chance on Blockchain Land Registry*, COINDESK (Apr. 24 2017), <https://www.coindesk.com/sweden-taking-chance-blockchain-land-registry/> [https://perma.cc/U7CM-DCLJ].

100. See, e.g., Prachee Mishra & Roopal Suhag, *Land Records and Titles in India*, PRS INDIA (2017), <http://www.prsindia.org/uploads/media/Analytical%20Report/Land%20Records%20and%20Titles%20in%20India.pdf> [https://perma.cc/3QRA-W3VD].

records being corrupted by fraudulent officials.¹⁰¹ In the Republic of Georgia, for example, the technology is being considered for that very purpose.

Another application for blockchain is likely in preparing for disaster, which affects both developing and developed areas. In 2005, the Louisiana Health Department's Vital Records Office was flooded when Hurricane Katrina struck and destroyed much of New Orleans. The water destroyed birth certificates, death certificates, marriage licenses, and divorce documents.¹⁰² The decentralized nature of blockchain's protocol and data storage should be an attractive feature to records managers located in disaster-prone areas. Indeed, some of the most notable blockchain developers today are cooperating with governments in developing nations for this purpose.¹⁰³

Finally, improved public access to records existing across multiple city and county offices makes blockchain likely to be implemented in the mid-to-long-term future. As it did in Cook County, a blockchain-based records system and online visualization can help the public avoid being defrauded into purchasing condemned property that previously would have been difficult to discover. Partial integration of blockchain technology could significantly advance the goal of making land records more accessible to the public.

Altogether, many counties will not find blockchain technology worth the cost of a research and development phase—as Cook County and Davidson County have—until blockchain-based land titling systems and automated, smart-contract-based recordations become a reality. It will certainly be years before blockchain is implemented in a meaningful way in counties throughout the United States. But despite skepticism brought by the highs and lows of blockchain's most popular current means of implementation in our society—the online exchange of virtual currencies—enthusiasm for blockchain development in real estate and other industries remains high. For real estate specifically, blockchain's smart contracting and recordkeeping capabilities may support the next major wave of improvements in conveyances and land titling, establishing among real estate buyers and sellers a truly new “chain” of title.

101. See *Can Blockchain Bring An End To Corruption?*, HUFFINGTON POST (Jan. 3, 2018, 7:00 PM), https://www.huffingtonpost.com/entry/can-blockchain-bring-an-end-to-corruption_us_5a4d6ba8e4b0d86c803c7bd4 [<https://perma.cc/9GY2-3526>].

102. Bob Sullivan, *Katrina Victims Face Identity Crisis*, NBC NEWS (Sept. 13, 2005, 3:48:49 PM), http://www.nbcnews.com/id/9316512/ns/technology_and_science-security/t/katrina-victims-face-identity-crisis/ [<https://perma.cc/M8S2-S6V3>].

103. Brady Dale, *Three Small Economies Where Land Title Could Use Blockchain to Leapfrog the US*, OBSERVER (Oct. 5, 2016, 7:19 AM), <http://observer.com/2016/10/benben-factom-bitfury-ghana-georgia-honduras/> [<https://perma.cc/N6AA-SG7N>].