

# Blockchain and real estate: A global revolution in the making?

The real estate industry is ripe for disruption, and blockchain could be the answer to improving efficiencies



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Blockchain has the potential to revolutionise the way real estate is managed and transacted globally, explain **James Johnson** and **Holger Wolf**, partners of global law firm White & Case

In 2008, bitcoin announced itself as the first blockchain application, introducing the world to distributed ledger technology—a secure and transparent peer-to-peer payment protocol. Fast-forward a decade and blockchain is transforming the way global business is done—across industries. In the financial services sector, fintech companies are deploying blockchain to enable retailers and consumers to deal with each other directly, disintermediating lenders. In the mining industry, blockchain is used to track the entire diamond supply chain to ensure that the stones are ethically sourced. In the global fishing business, blockchain is helping to improve tuna traceability and stop illegal and unsustainable practices. Blockchain has also found applications in energy trading and car manufacturing—and it also has the potential to revolutionise the global real estate industry.

## What is blockchain?

In a traditional database, data is stored and managed from a single source. In a blockchain environment, data storage and management is decentralised. Here, one public record or database (often referred to as a 'ledger') is distributed across a network of computers (a 'decentralised peer-to-peer network'). The database is secured by sophisticated cryptography safeguarded by so-called 'miners'—computers that process transactions and ultimately verify that they can be uploaded to the database. The network can either be completely public and available for any user who is interested in participating, or private meaning that only designated users have the ability to participate. Every new transaction or information 'block' added to a blockchain is immediately available for every network participant. The need to transfer information from one party to another or separately record and store that information falls completely away.



**46%**  
of Deloitte's blockchain survey respondents say they would be comfortable using a smart contract instead of a paper-based contract

Source: Deloitte

The blockchain database grows exponentially in this way, forming a comprehensive record of all transactions that have occurred since the database's inception. Once recorded, it is impossible for data to be removed, edited or revised—the data is immutable and resistant to fraudulent modification.

But the data in this environment is only as reliable as the entity or person who is recording it, and so will need verification. For real estate, this will require collaboration between traditional data providers: appraisers, due diligence providers, notaries, and brokers.

## Blockchain in land registration

Real estate is full of registries: Governments or courts often maintain multiple registries of who owns what land and the various interests affecting it; brokers must keep a registry of investors and what shares they own; and landlords have registries of their tenants. There are many issues with these registries, which are often slow, disparate and uncoordinated. In the US, for example, records are kept by individual counties, each with different standards and protocols, making interoperability a problem. In Dubai, there is one central entity that all real estate transactions must go through, creating a slow, expensive and paper-heavy process. Blockchain—at its core, a new type of registry—appears tailor-made to address these challenges by digitising a traditional land registry and moving the industry away from its historic and now technologically outdated models.

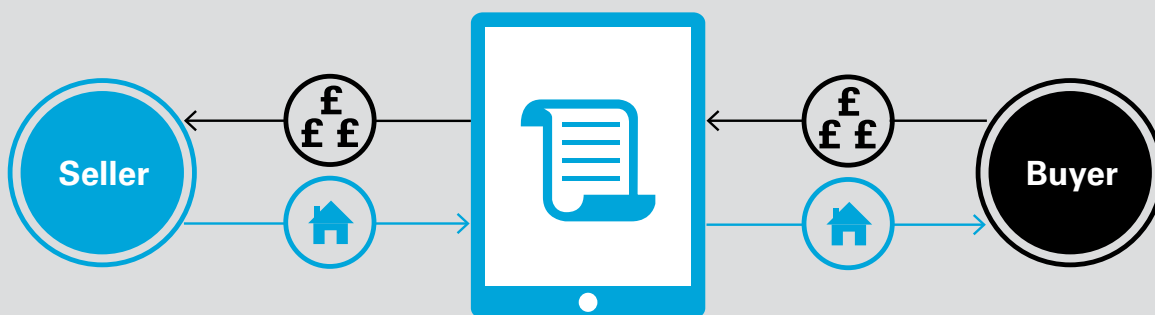


**Blockchain has the potential to revolutionise the way the real estate sector operates, from smart contracts to management and execution of property sales and leases, and to the adoption by land registries**

## Three benefits of blockchain for land registries



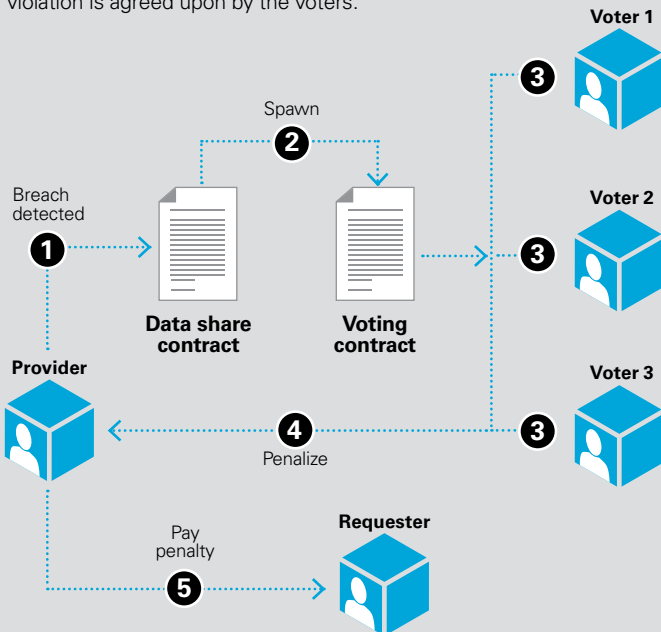
## How smart contracts would work in a simple property sale



# Many jurisdictions

## Agreement breach process

A voting contract is spawned that leads to penalties if the violation is agreed upon by the voters.



Source: ArXiv.org

A blockchain-based land registry will have all the same functionality—tracking property titles, ensuring single-ownership, keeping a seamless and near-instantaneous record of all transactions and third parties’ rights—but with the added advantage of streamlining and enhancing the way real estate transactions are logged and executed. “Using a blockchain as a shared registry has the potential to make investing, transacting and renting real estate cheaper, more efficient and more transparent,” said Joseph Lubin, Founder of ConsenSys, a US-based blockchain software technology company.

### Smart contracts

The benefits to the real estate industry go beyond the creation of an ‘alternative’ land registry. A combination of blockchain and so-called ‘smart contracts’ in property sales, purchases or leases could likewise transform the industry. Smart contracts administer and execute without the need for human interaction. In commoditised real estate transactions such as residential

conveyancing, smart contracts could reduce or even eliminate the need for lawyers and other intermediaries.

Many legal agreements are complex and contain provisions that are never actually used by the parties in practice. But by using blockchain, property service agreements with clear delivery targets and penalty regimes can be administered automatically in ways that have not been previously possible. For example, datacenter ‘smart contract’ service agreements that require an operator to provide a customer with specific power, temperature and humidity requirements would automatically award the customer service credits if sensors in the facility detect a breach. These contracts can be built into a blockchain database and could be self-executing without human intervention.

### Real estate asset and property management

Asset management could also be streamlined by blockchain technology by making property more accessible and liquid as an asset class with all



In the US real estate industry, land and title registries are typically managed by individual municipalities, and many cities are exploring the potential for blockchain to reduce cost and improve transparency. South Burlington, Vermont has recently launched a pilot program to move property and deed records onto a blockchain database in an effort to address fraud. In the private sector, a consortium of banks is testing a blockchain platform to record and securitise real estate mortgages and eliminate managing payment flows to investors, particularly when mortgage rights are resold to secondary investors.

Real estate investment trusts (REITs) are exploring how blockchain could facilitate compliance checks for new investors to ensure compliance with federal regulations.



Brazil’s real estate registry office, the Cartório de Registro de Imóveis (CRI), is piloting a program in two municipalities involving the replacing of its current paper-based system with blockchain databases to help minimise fraud and promote investor confidence.

By improving the accuracy, security and transparency of its records, the CRI recognises that blockchain records are immutable, meaning that they are not susceptible to theft, corruption, damage or fraud.

# ations have recognised the potential of

UK 

HM Land Registry considers exploring the potential of blockchain as key to its ambition to become the world's leading land registry in terms of speed, simplicity and an open approach to data. This is despite England and Wales already having an established and well-developed central land registry.

Part of this strategy will involve HM Land Registry working with the private sector to research and test new digital registers, including exploring the potential uses of blockchain technology—a scheme the Land Registry calls 'Digital Street'.

One possible application being considered is a digital property exchange assistant designed to assist with residential conveyancing. An online service will use smart contracts to digitise and automate the transfer of funds and the updating of a blockchain-based register.



Germany, Austria,  
Switzerland, France and Italy



In **Germany, Austria and Switzerland**, the central land register determines property ownership and any changes to the register (and therefore ownership or the rights affecting or benefitting the property) must be validated by both a notary and the land registry. In **France and Italy**, the approach is different. The notary and the land register record the transaction that has taken place, but that does not determine the transfer of title or the creation or modification of the relevant property interest. Despite these differing approaches, the notary retains a prominent role and, perhaps because of this, there appears to be little appetite at present in any of these jurisdictions to move from a notarial system to a pure blockchain alternative, but a blockchain that is only accessible by notaries and land registries may be the future here.

Sweden 

Sweden is an example of an established and paperless land registry embracing blockchain technology to improve its services.

The national land registry of Sweden, the Lantmäteriet, has been trialing blockchain technology for property transactions for the past two years, including for the registration of land and properties. If this approach is permanently adopted, it could enable the registration process to be reduced from between three and six months to a matter of hours.

# of blockchain

## Dubai

With its Blockchain 2020 initiative, Dubai has been extremely open to the adoption of blockchain. In 2017, the Dubai Land Department announced that it is developing a system to record all real estate contracts on a blockchain. The move is part of a greater scheme to secure all government documents on a blockchain and increase the confidence of global investors in Dubai real estate.

The Dubai Land Registry cites the key benefits of using blockchain technology as allowing investors to verify property data backed by timestamp signatures and enhancing the accuracy of the data, the credibility of investment transactions and the transparency of the market. Additionally, in relation to leasing, the potential applications of blockchain include creating a convenient registry for tenants whose leases would be recorded on the blockchain and connecting tenants, not just with landlords, but also with property-related facilities such as electrical, water and telecommunications utilities, allowing for paperless electronic payments to be implemented.

## Japan

The Japanese Land Ministry will trial a blockchain-based land registration system in the summer of 2018 in a number of selected cities with a view to rolling it out nationwide if successful.

The Ministry envisages a number of potential benefits of the new blockchain-based system as follows: improved regional disaster preparation; an ability to make better use of vacant houses or properties with unknown owners; assistance in discussions with landowners regarding redevelopment and public works projects; and overcoming difficulties with municipalities confirming information required for fixed-asset taxes.

As of April 2018, Zweispac Japan, a real estate tech company, began live testing of its patented blockchain-based property registry. Zweispac is integrating the blockchain-based system into its 'Ohudokun' product, which aims to streamline real estate sales and reduce registration fees.

## India

In October 2017, the government of Andhra Pradesh in India teamed up with Swedish start-up ChromaWay to create a land registry based on a blockchain system for its new city of Amaravati. This will allow users to search through property records using a conventional search engine.

## Singapore

The Singapore Land Authority's (SLA) Torrens System, which guarantees an indefeasible title for properties included in the register, is renowned for its reliability and accessibility. In March 2017, the SLA's Chief Investment Officer reported that blockchain technology would be unworkable in Singapore's highly centralised and trusted model. It seems therefore that the Singaporean system is such that the utilisation of blockchain would be limited in its potential to make the system more secure or advanced, and has subsequently not been implemented.

relevant data available on a single online platform. This has obvious attractions for owners, prospective purchasers and tenants. “Not only does distributed ledger technology offer opportunities to streamline the existing process, it also opens up new market opportunities”, explains Alex Edds, Director of Innovation at JLL. “The concept of buying shares in a real estate asset anywhere in the world is made more viable through the use of blockchain.”

Another possible application is in relation to property management and maintenance. For example, if all maintenance and services for the technical building equipment is recorded in a blockchain, the condition of a property can be easily reviewed and assessed by the owner, tenants and potential buyers, and reduce the need for technical due diligence.

### Building a new technological world order

Blockchain databases can be a tool for increasing efficiency, transparency and security for real estate transactions—providing a secure, permanent record that will speed up transactions, reduce costs and create a unified single registry accessible to all parties.

But the adoption of the new technology is going to vary greatly between industries and jurisdictions. Creating blockchain-based land registries may be appealing in countries that seek to encourage overseas investors and have less mature central land registries, as in certain parts of the Middle East, for instance. But more developed European jurisdictions, such as Germany and France, which took a long time to introduce digital signatures and electronic contracts, are likely to take a more cautious approach to the adoption of blockchain, particularly in an industry such as real estate which has historically been regarded as conservative.

“In developed markets, a top-down approach is the ideal



Certain estimates suggest that nearly **US\$1 billion** is spent annually on title fraud resolutions

**Source:**  
Inside Bitcoins,  
December 4, 2015

solution,” says Mohammad Shaikh, Co-founder of Meridio, ConSensys’s real estate branch. Existing land registries must be converted to a consistent format, and the gatekeepers of those registries must agree to transfer their data to the new system and eventually relinquish some control. In emerging markets where registries are in their infancy, a bottom-up approach could work better. Individuals must agree to certain standards for recording data, and the registry is built up by individuals and small organizations who want to claim ownership of real estate and make transactions. “In both cases, for widespread adoption there will likely need to be government acceptance of these registries as the source of truth,” says Shaikh.

In Germany, for instance, moving to a blockchain database controlled by the courts would enhance efficiency. Signing and closing of transactions, including registration of title or mortgages, could be completed in a single day rather than months. Due diligence of complex easements currently requires a physical visit to a local court and would clearly be much easier if accessible online through public notaries. Further publicly recorded information such as public easements, ground contamination and warfare records, monument protection, etc. could all be recorded in one database which is only accessible to the authorities to make registrations and to public notaries to review and apply for new registrations.

Where gatekeepers are in fact market participants themselves, there will be a particular need for acceptance of the technology underpinning blockchain and distributed ledger technology. But as Edds points out: “Blockchain technology doesn’t need to be scary. For the end-user, the experience is exactly the same. Much of the hype of this technology is actually in the back end that doesn’t require the end-user to understand the intricacies of how it works. Do you know how your iPhone works?”

### Bumps in the road to adoption

If blockchain technology is to succeed, it is crucial that the gap between the technical and legal worlds is successfully bridged, and in many cases there will need to be a fundamental change in the legal approach to address the many challenges that new technology brings.

For example, smart contracts are an appealing proposition, but can the technology accommodate the many facets of a typical commercial contract? After all, smart contracts are neither ‘smart’ nor ‘contracts’. They are self-executing computer programmes, included in a larger economic activity which has its own legal regime concerning non-binary concepts that require a degree of judgment. What is a ‘reasonable’ period of time? When is a party acting ‘unreasonably’ or ‘improperly’? Outside events or circumstances may influence how a contract is to be performed. What if the property that is being conveyed is damaged or even destroyed between exchange and completion of the smart contract? The market may need to provide insurance solutions to accommodate such scenarios. These questions require an application of the facts to legal concepts and obviously cannot be addressed through smart contracts.

There is also another challenge that has come to the fore with the recent implementation of the General Data Protection Regulation (GDPR). GDPR includes the ‘right to be forgotten’ if the data is no longer needed for its original purpose. But by default, data entered into blockchain cannot be erased or removed. So on the face it, blockchain databases in EU Member States appear to be in breach of this requirement. This, too, will need to be addressed.

Many questions still remain, and building trust in the new technology will take time. But one thing is certain: Real estate professionals, law makers, technology developers and regulators must work together to confront the difficulties—and embrace the transformative powers—that blockchain technology can bring to real estate.



**40%**  
of Deloitte’s blockchain survey respondents believe there is value in recording existing contracts on the blockchain

**Source:** Deloitte

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