

REFLECTIONS ON TRUST AND AND THE USE OF DISTRIBUTED LEDGER TECHNOLOGIES IN LAND REGISTRATION

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When distributed ledger technology is discussed in land registration matters, generally we immediately refer to Blockchain. Since its first appearance, I have been attracted but also am vaguely uncomfortable to the risks it may produce. An event in the art world, showing some similarities, was the trigger to write down current reflections.

Let me start by asking your attention for a short movie, telling an odd story. At first glance it seems to have little to do with the organization of land registries, however, it does! Anyway I will try to explain the relevance.



This used to be an art work by Banksy, called “ Girl with ballon”. If you want to see how it was transformed into “Love is in the Bin”, please have a look at this You Tube movie:

<https://www.youtube.com/watch?v=vxkwRNIZgdY>

¹**Banksy** is an anonymous England based street artist, vandal, political activist, and film director, active since the 1990s. His satirical street and subversive epigrams combine dark humor with graffiti executed in a distinctive stenciling technique. His works of political and social commentary have been featured on streets, walls, and bridges of cities throughout the world.

Banksy displays his art on publicly visible surfaces such as walls and self-built physical prop pieces. Banksy no longer sells photographs or reproductions of his street graffiti, but his public "installations" are regularly resold, often even by removing the wall they were painted on. A small number of Banksy's works are officially, non-publicly, sold through "Pest Control", his agency.

In October 2018, one of Banksy's works, *Girl with balloon*, was sold in an auction at Sotheby's in London for £1.04m. However, shortly after the gavel dropped and it was sold, an alarm sounded inside of the picture frame and the canvas passed through a shredder hidden within the frame, partially shredding the picture. Banksy then posted an image of the shredding on Instagram captioned "Going, going, gone...". After the sale, the auction house acknowledged that the self-destruction of the work was a prank by the artist. The prank received wide news coverage around the world, with one newspaper stating that it was "quite possibly the biggest prank in art history." A man seen filming the shredding of the picture during its auction has been suggested to be Banksy. Banksy has since released a video on how the shredder was installed into the frame and the shredding of the picture, explaining that he had surreptitiously fitted the painting with the shredder a few years previously, in case it ever went up for auction. To explain his rationale for destroying his own artwork, Banksy quoted Picasso: "The urge to destroy is also a creative urge". It is not known how the shredder was activated. Banksy has released another video indicating that the painting was intended to be shredded completely. The video shows a sample painting completely shredded by the frame and says: "In rehearsals it worked every time...".

The woman who won the bidding at the auction decided to go through with the purchase. The partially shredded work has been given a new title, "Love is in the Bin", and it was authenticated by Banksy's authentication body Pest Control. Sotheby's released a statement that said "Banksy didn't destroy an

¹ Wikipedia

artwork in the auction, he created one," and called it "the first artwork in history to have been created live during an auction."².....

What on earth this event got to do with land registration? Right, nothing, at first sight! Nevertheless it is a perfect example of what might similarly happen if a distributed ledger technology was introduced in land registries.

Up until now, when we talk about this technology we generally speak about Blockchain. Numerous times it has been praised as the future for land administration, brushing away all other quality proof practices we ever used.

Of course, as Yuval Noah Harari wrote recently, companies and entrepreneurs who lead the technological revolution are naturally inclined to praise their creations. It is up to others to sound the alarm and explain what can go wrong³.

In practice we must admit that all efforts to install Blockchain, as a self ruling peer-to-peer system for land registration, seem to have failed up until now. However there seem to exist interesting examples for parts of the process. I mention, among possible others, back up control in Estonia and fraud prevention in India.

It isn't surprising that in circles of land registration, Blockchain gets that much attention, given that it exhibits interesting characteristics. First of all the process of land registration is based on trust. In general this trust on real estate transactions and proof of existing "Rights in Rem" is guaranteed by the state in which the property is located. The more security the system provides, the more expensive it gets, and a lot of states are tempted to look for cheaper alternatives. Privatization may be a word often heard. But also reduce or even exclude human intervention in the administrative process may be a goal.

Furthermore a number of states fail in practice, to a greater or lesser extend, in providing the security they legally promise, which is very devastating for the confidence of the economy in real estates markets. It causes a significant loss of value for the integrated market.⁴

² more about the context: <https://www.youtube.com/watch?v=X-6jMi4e-0Q>.

³ Yuval Noah Harari, 21 lessons for the XXI century, 2019 Jonathan Cape London, EAN 9781787330870

⁴ see <https://fragilestatesindex.org/>

Another very interesting feature for land registration is the fact that after a transaction has been validated by the system, it is immutable. In fact up until now the fourth dimension, time, is also included in many land registration systems. Once a registration is made in general you cannot undo it and only change it by making a new entry, perhaps restoring the situation identical to what it was before, leaving a chronological trace to every change whatsoever. This is exactly the model Blockchain uses as well. Every change in the chain will remain traceable.

Nevertheless, as things stand now, Blockchain technology, does not yet seem to be mature enough to take over huge processes such as an entire land registry. It seems to be incapable to handle huge amounts of transactions; the energy consumption is outrageous; putting the existing information into initial hashes might be a hell of a job; control by someone for more than 50% of the peers makes trust disputable; gathering information on many computers at the same time is data space consuming and decreases security, and so on.

But I am convinced that the basic features of Blockchain, providing group security by its own approval, in a cheap manner is so interesting for registering transitions of Rights in Rem, that we may be assured that sooner or later, perhaps sooner, a “Blockchain 2” technology may appear. At least after some technological features may be improved together with a more structured use. The sociological element may become more important than the technology itself.

At first sight the immutable character of a Blockchain hash, due to the distributed character, may seem to be a very interesting to help in the prevention of external fraud. But when we look a bit deeper at fraud cases it are only the less smarter attempts this technology may be able to tackle. Data breach in general is not a very big issue for land registration, since in its origin it generally wants to be transparent anyway. Of course there are limits and we should not forget the effects of the GDPR.⁵ Huge external frauds in general do not attack the system and its particularities themselves but manipulate data. In general as well distributed as centrally electronically kept ledgers contain that many security measures that most likely a fraudulent action of that kind very soon will be detected. Fraudulent transactions, perfectly following the logic of the system, but at the end of the chain allowing to collect the money make much more chances to be successful. As an example; in 2016, 101 million Dollar was stolen from the account of Bangladesh at the US Federal Reserve. The Reserve’s database was not hacked at all. But access was gained to the Swift terminal of the Bangladesh bank wherefrom payment instructions were sent to the Federal Reserve to pay out that

⁵ General Data Protection Regulation - EU regulation 679/2016

money.⁶ Although it was a very huge amount of money, the transaction appeared to be perfectly normal to the the system. A Blockchain database at the Federal reserve wouldn't have made any difference. Perhaps Artificial Intelligence might have. What is more, blockchains in general turn on a cloud platform where many security measures are taken. But most likely there still is a possible leak somewhere. Also the fact that information is kept on so many independent computers, perhaps not all of them perfectly hack proof is not exactly a fundamentally secure option. At the level of internal fraud, it may be possible to prevent that a greedy civil servant all at once tries to transfer a property to its name or a registration fee to his account, but no more than that. So, agreed the Blockchain itself may difficult to breach, but it does not prove to be much more efficient to prevent fraud than a well kept central ledger system.

But let me return to our friend Banksy and try to explain where I found similarities that triggered me to start writing. As an artist, the man, or whoever he may be, inspires me a lot. But the way he, and most probably with him the auctions house Sotheby's, influenced the market mechanism is another thing. Where the art market, to some degree even might be charmed by the prank, it worries me when I discover possible similarities in a land registration environment where it wouldn't be appreciated at all!

The art market and the valuation of works of art, reflected in auction prices is a typical example of distributed decision- making power. Since the market for up- market artifacts is organized worldwide, probably no individual party has the power to influence it fundamentally, that is at least true if there is no fraud at the level of the platform on which it turns. How does the mechanism work?

The artist finishes his work and then he or his agent put it on the market. Let's say, in Blockchain terms, at that point the initial hash is produced. From this moment on the value of the art work is determined by several factors:

the technical quality; the sociological relevance of the artist and the work (which, for the case of Banksy is obviously very high); the scarcity; the commercial quality of the agent and galleries supporting the artist as well as the auctions houses. But we can imagine that in general, since they work with top quality art at a global level, they are top quality as well; fashion, what painting do rich people may want to show to their visitors and business partners to impress them? All these elements

⁶ <https://www.wired.com/2016/05/insane-81m-bangladesh-bank-heist-heres-know/#>

together determine the actual value of the masterpiece. This is a personal vision that is not necessarily shared by the art market itself⁷.

When one of these elements changes, all distributed players in this process of valuation will note it and finally all actors in the market will agree on the actual value, visualized in the final auction price. It acts in a similar way as a blockchain where every change is approved by the entire peer to peer net. The only important element we forgot up until now is trust. The basic trust issue for art works is the authenticity.

In general it is accepted that at least 20% of all dedicated works in museums are false. As an example, CNN last year revealed that at the Etiënne Terrus Museum in Elne, the southern French village where the painter was born, at least 82 of 140 paintings are counterfeit.⁸

Last year in Ghent, Belgium, an art exhibition of Russian Avant-garde paintings was closed after it became clear that all paintings were false, even after international experts had declared them to be authentic!⁹ Who hasn't heard about an old master's painting that loses and regains his authenticity seal, depending on the expert.....

But for living artists, the only reference of trust of course is the artist himself. Let our friend Banksy be also here a special one. As he wants to remain anonymous as a person he went into sea with a

company called "Pest control". Next to having a nice logo, this is what they tell about themselves:



"Pest Control is a handling service acting on behalf of the artist BANKSY.

We answer enquiries and determine whether he was responsible for making a certain piece of artwork and issue paperwork if this is the case. This process does not make a profit and has been set up to prevent innocent people from becoming victims of fraud."¹⁰

The work sold at Sotheby's officially was recognized by Pest Control for Banksy as being an original work!

⁷<https://www.youtube.com/watch?v=ekzjYZHs27E>

⁸<https://edition.cnn.com/style/article/french-museum-half-paintings-fake-intl/index.html>

⁹<https://www.theguardian.com/world/2018/mar/20/belgian-police-examine-claims-russian-art-show-full-fakes-ghent>

¹⁰<https://pestcontroloffice.com/>

It may be clear that the whole performance at the auction had a significant influence on the value of the art work. Luckily for the buyer and Sotheby's it did rise the value. But nothing guarantees that. We see Banksy himself as the initiator of the process, producing the primary hash, in which he included all the elements that constituted the initial value. But what if the initiator cheats? What if he deliberately installs a bug into the initial hash? Certainly when the platform is commercial, in the long term we cannot exclude this possibility.

In the example it is not the market mechanism that fails. Coming back to Blockchain, it appears that distributed ledger technology solutions are safe enough to stand the comparison with human action as well. But here it are the preconditions that are tricky. Is the initial hash, without any discussion representing the property? Do changes in the physical and legal situation of it have any influence on the electronic representation? All together we must admit that the fundamental shortcomings we attach to the Blockchain in its present appearance are due to the lack of a legal framework in which we can launch the system in a secure surrounding. Solving the technical problems is only a question of a (presumably short) time. The real problem is, and always was, the experienced confidence in the initiator and final responsible party, no matter what technical solutions was used. For the auction market around the works of Banksy, the initiating artist certainly did not respect the initial conditions under which the final version of the art work was put into the market, on which the interested buyers put their trust.

When it comes to working with a distributed ledger technology in the organization of a land registry, the trust and confidence of the markets, in general, and citizen, in particular, is essential.

This trust is for a largely based on the legal framework. System depend on it, states declare themselves responsible and offer guarantees. But as I told, not all countries offer their citizens in practice the security their legal system promises. So, also the chosen operational solutions are important. Do they offer enough security? Is the promised degree of security achieved in reality? The remaining question is: who should be the ultimate initiator and responsible when a distributed ledger system is to be adopted?

Should it be a perfectly anonymous system with no unique and final responsible? If that solution is at stake, one cannot forget that there always has to be an introducer of the original hashes. Also it most certainly will be run on a commercial platform. But what happens if this platform all at once turns out to be no longer commercially interesting? This is definitely a situation that a land registry

does not want to face. The idea of an IT system, combined with AI, leading a life of its own, might even be more frightening.

Entries in such a system have to be by definition indefeasible. Nevertheless, deliberately or not, there may have occurred some mistakes into the initial hashes. Furthermore is property law on real estate in general not very compatible with the 0/1, yes/no, culture of informatics? So, it may be necessary to alter things at a certain stage.

There is comparison possible with the land registration systems themselves as well. One of the initial principles of the Australian Torrens system is exactly the indefeasibility of the legal ownership after registration. Furthermore obtaining property by means of acquisitive prescription used to be impossible. Yet, over history, minor discussions on boundaries arose and never got solved. Finally in some states there was installed a limited possibility to acquire property this way anyway.

Perhaps a private distributed ledger system might be a better idea. In that case the state, or for privatized land registries, the concessionaire, would most probably be the ultimate responsible.

In any case the technical development probably will be outsourced, most likely to a private company anyway. In that case the reliability of the ledger goes as far as the reliability of the developer himself. In between we know the power that worldwide acting companies have developed and also their idea about ethics. If they run a system and mix it with artificial intelligence, a situation might occur where the individual and his rights, lose every relevance. A situation where protection of rights of whatever citizen, is fundamentally no issue anymore. I don't think this is a future situation most of us want to face! Naturally, when this option is chosen, finally it would be most likely that the operations are backed up by the state, which might give a degree of reassurance. Last centuries we have lived in the knowledge that state guarantee was the strongest possible one. But that belief seems to be fading as well.

To a lot of politicians land registration is not necessarily the deepest concern of their politics. Certainly in countries with a very secure system, this tends to be considered as too expensive. More and more personal treatment of registering is taken over by IT solutions. For 90% of the transactions this is acceptable. But as I mentioned before, gathering the necessary information out of a contract in order to provide legal security is not easily to catch in a 1/0 pattern. Even in what we call democratic states the amount of big data land registries dispose of, may politically be used to decrease the legal

security of citizen instead of the opposite. Furthermore we have to admit that there are a lot of states that in practice do not deliver the legal security their legislation promises. There are even some totally fragile states states, failing in delivering the necessary stability and trust.¹¹ Often they are in a conflict or post- conflict situation.

In these cases a distributed ledger system might increase security to their citizens and the markets on real estate.¹² Many developing countries don't have a sustainable system of tracking property rights. If they do so, it may be fragile and unreliable. In Haiti, for instance, a large earthquake in 2010 destroyed all the municipal buildings that stored documents confirming many small farmers' ownership of the land they worked. Even years later, many farmers didn't have proof that they were landowners. People are still fighting over their land. This kind of a problem, caused by natural disasters or not, is widespread, causing financial hardship for families in the developing world. Without an official, enforceable legal title to their property, people can't resolve disputes on who can use which land for what or who can farm where. They also can't borrow against their existing assets to invest in their homes, businesses or communities. The value of those properties, and the lost economic opportunities for owners of assets without formal documentation, has been estimated at US\$20 trillion worldwide. This example illustrates the relationship between poverty and the lack of adequate land registration. There have been numerous attempts, often by NGO's, to remedy this situation. But most of them worked on a too geographical scale, too often without a local commitment, lacking the perception of sustainability. It looks like often the ultimate beneficiaries were the organizations themselves as well as the commercial firms selling inadequate solutions.

We must also recognize that the relation between real estate and the rightful claimant is becoming more and more an international story. People less and less live within a national context. Even if you still believe in the nationality concept of people, it is undeniable that property issues are getting more and more an international affair. If documentation on real estate operations could exceed the national level, it most probably would increase the security. Therefore, it might be an interesting idea to think about organizing land registration internationally in a further future. The bigger the controlling community and the more diverse, the more guarantees an individual gets to be treated rightful. Although it looks like mayor current problems and challenges for humanity will not find solutions within national frameworks, we certainly have to take into account the still existing state organized

¹¹<https://fundforpeace.org/2019/04/10/fragile-states-index-2019/>

¹²<http://theconversation.com/blockchain-based-property-registries-may-help-lift-poor-people-out-of-poverty-98796>

world. The extend and the rules on proof of ownership of Rights in Rem are still are always state regulated. Legislation on property is practically nowhere identical. This is not even the case in the European Union, where open markets and the principles of freedom of movement of people, capital, and labour prevail, and where one might expect a unifying movement. Article 345 of the Treaty on the Functioning of the European Union is quite clear: “The Treaties shall in no way prejudice the rules in Member States governing the system of property ownership”.¹³ Open markets minded lawyers may have tried to explain the extend of this legislation as limited as possible, but nevertheless it still stands.

So, certainly for the coming decades we may perhaps see the opportunities for a unified collection of data on Rights in Rem and real estate transactions. But the legal effects certainly have to be accepted as nationally organized. Nevertheless IT is developed to an extend that this certainly is technically possible.

But who will eventually pull the strings when land registration is to become supra- national and possibly kept as a distributed ledger? Wouldn't it be advisable that the final gatekeeper of all these technologies was an internationally accepted player?

On an international scale there are the commercial players as Google and Amazon. But I'd be extremely cautious to hand over the operational part of a land registry to one of them. We have to keep in mind that an inestimable amount of data might find its way to commercial and artificial intelligence applications, for purposes else than legal security. Also when the platform is no more profitable it may no longer be maintained, with disastrous consequences for legal security of the individual, who may, as I told before, have become irrelevant in between!

So we should look out for an international player that can provide the largest possible basis of mutual trust. It must be possible to respect national legal choices but nevertheless ensure security in an international way. The more people and communities are involved in such an approach, the more guarantees it can provide and the more control there might be on order to face abuses.

Keeping in mind these criteria, there are only few possible actors left. On a more regional base the European Union might be the right party. In this context the “Land Registers interconnection” (LRI)

¹³ Consolidated version of the Treaty on the Functioning of the European Union - PART SEVEN: GENERAL AND FINAL PROVISIONS - Article 345 (ex Article 295 TEC)

project of the EC may be very interesting as a starting point¹⁴. We look out to the implementation. But anyway the system will only facilitate the retrieval of information out of the national land registries. It will not add any additional legal security to the citizen. The data themselves will not be kept at a EU scale. The integration in LRI of the outcomes of the IMOLA projects of European Land Registry Association (ELRA), which will add information on legal terms in the different national jurisdictions,¹⁵ certainly is a step in the right direction. But it should go further. Only an engagement at a European level of the different Member States can ensure an increased mutual trust. As a preferential partner for land registration issues, ELRA might be able to develop operational solutions.

But to my idea it would be even more interesting to see it on a world scale. Then there might be perhaps a role left for UN or World Bank. The idea may look perhaps too ambitious but certainly for the UN it could at least become an active contribution to the achievement of their proper “Sustainable Development Goals” project. Goal I consists indeed in eradicating poverty in all its forms, everywhere. One of the indicators to monitor the evolution at a national level is measuring the proportion of the total adult population that enjoys secure tenure rights to land, with legally recognized documentation, and who perceive their rights to land as secure, by sex and type of tenure.¹⁶ If an overall respected organization as the UN itself was to play a more active role in documenting the existing rights it certainly would protect world’s citizens.

The World Bank also could be in the picture. Every year they organize a “Conference on land and Poverty”¹⁷. They clearly recognize the relation between security of tenure, land registration and economic and social prosperity, and have a lot of experience in delivering practical operational solutions in the field. I think it would be an effective contribution if one of these organizations was to become gatekeeper of a platform on which a distributed ledger technology for land registration operations could turn, offering the greatest possible guarantees for the world's population, in all continents and ready to adapt to challenges as AI.

Perhaps, I may be too much of a dreamer to believe that all of this is possible.

But I am convinced that in the globalized world we live in, only a joint action of mankind can lead disrupting technologies into the right orbit.

¹⁴https://joinup.ec.europa.eu/sites/default/files/inline-files/SEMIC%202018_Sima.pdf

¹⁵<https://www.elra.eu/imola-ii/>

¹⁶<https://unstats.un.org/sdgs/metadata/>

¹⁷<https://www.worldbank.org/en/events/2020/03/16/land-and-poverty-conference-2020-institutions-for-equity-and-resilience>

As far as the present is concerned, I will try to find further inspiration in the social commitment that Banksy's works express, included this very recent work ¹⁸.



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¹⁸<https://www.independent.co.uk/homeless-fund/banksy-graffiti-new-homelessness-christmas-birmingham-location-a9239251.html>