BLOCKCHANGE

BLOCKCHAIN TECHNOLOGIES FOR SOCIAL CHANGE

CASE STUDY:

Addressing Transaction Costs Through Blockchain and Identity in Swedish Land Transfers

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PROJECT DESCRIPTION

Problem Definition

Real estate in Sweden is currently worth over SEK 11 trillion (approx 1.2 trillion USD), around three times the value of Sweden's GDP. For many Swedes, their homes are both their largest asset and their greatest source of personal debt, with almost SEK 3 trillion in mortgages.

Despite the tremendous economic importance of buying landed property, existing land transfer processes are often slow, vulnerable to error, and less than transparent. The time it takes between the signing of the contract and the transfer of title could be between three and six months.[1]

The Lantmäteriet, the official Swedish Land Registry, is one of the oldest government agencies in Sweden but committed to leveraging new technology to improve its services and processes. In the 1970s, it was one of the first public authorities in the world to digitize its land registry. However, although the land registry database is now digitized, the land transfer process is not. Rather, it is held back by the state of existing information technology and legislative constraints.
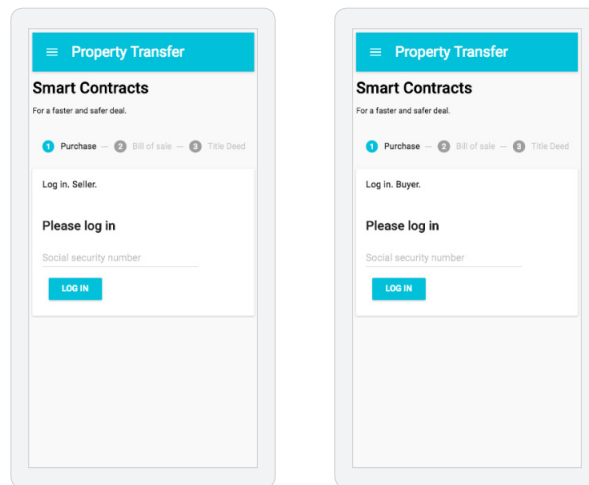
Under the existing land registry system, the Lantmäteriet only became involved relatively late in the transfer process: when the buyer's bank sends the title registry application, bill of sale, and any application for a new mortgage to Lantmäteriet. As a result, the transfer does not become visible within the registry until long after contracts are signed.

Since Lantmäteriet is the most trusted actor within the process, its absence from earlier phases reduces transparency and trust. The existing process is slow and involves significant investments of time and effort for document preparation, authentication, and verification: processing a real estate sale from the signing of a contract to purchase to land transfer takes an average of four months.[2]

Although much of the process of land registration has been digitized since the 1970s, the efficiency and accuracy of the existing land transfer process have been held back by legacy processes and legislation mandating paper transactions and physical signatures. The process currently involves numerous paper documents that must be physically signed and exchanged via regular mail. Signing a contract of purchase alone can take two hours, and verifying documents and the identity of signatories is done manually.[3]

In addition to the land transfer process not being digital, entries in the land registry can be missing, incomplete, or wrong. The volume of documentation required and the amount of duplication of data entry increase the risk of error, and between 4-7 percent of applications need to be re-submitted because of error.[4]

In addition, security provisions built into legacy systems have prevented further digitization of the land transfer process, for example by imposing restrictions through firewalls and limits on network connections. As a result, while some institutional actors (including realtors, banks, and some government agencies) could connect their systems to Lantmäteriet databases, individual buyers and sellers could not.[5] The resulting asymmetries (of access to both markets and information) distort the Swedish real estate sector in favor of larger, institutional actors, at the expense of average home owners.

"[P]rocessing a real estate sale from the signing of a contract to purchase to land transfer takes an average of four months."

Blockchain Use

In 2016, actors from the Lantmäteriet strategy consultancy Kairos Future, along with the telecom Telia Company and the blockchain startup ChromaWay, began to explore potential blockchain applications for real estate in Sweden. Quickly identifying property purchase and land transfer as a compelling use case. The consortium developed a prototype in which real estate transactions would be put on the blockchain the moment an agreement to sell is reached and remain until the land title is transferred. The prototype sought to limit information asymmetries by allowing all parties — banks, land registry, brokers, buyers, and sellers — to monitor the progress of the transaction,[6] and potentially produce cost savings of more than €100m a year.[7]
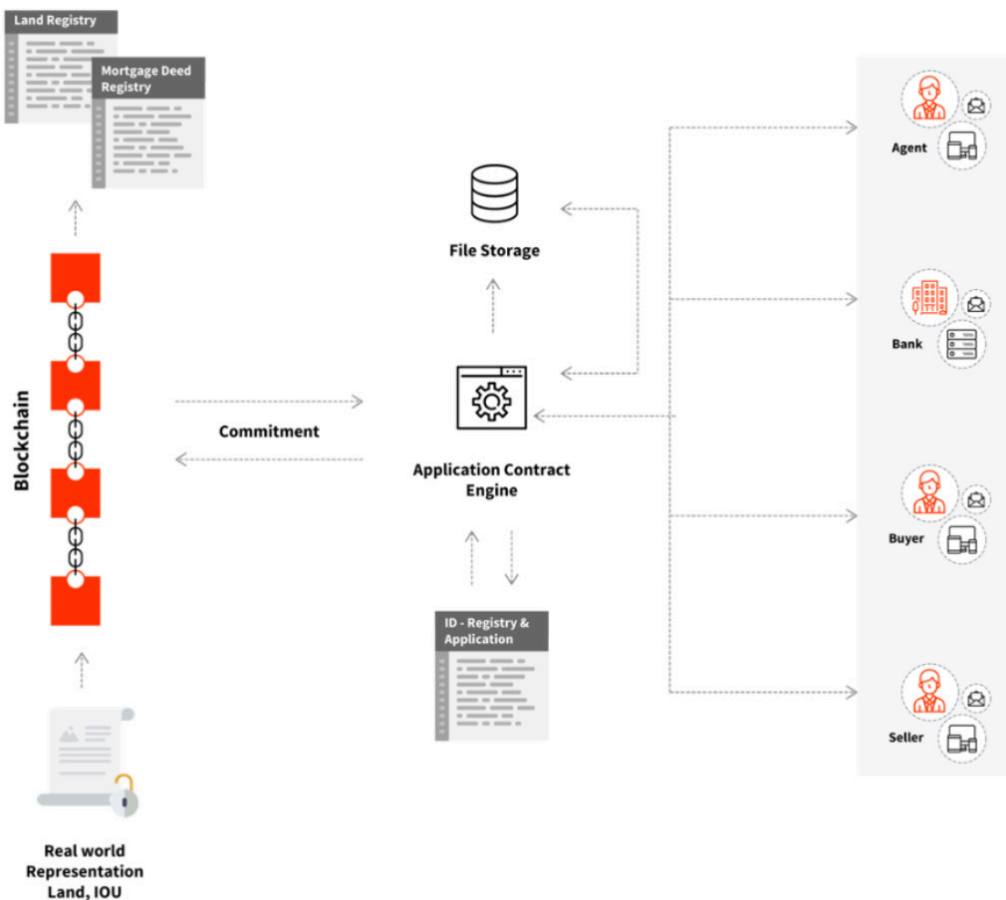
The blockchain identity built on a digital ID system developed by Telia, a Swedish telecommunications company and mobile network operator. The identity can be used in mobile phones with or without a Swedish personal identification number. At the time of launch, the Telia Digital ID solution was already being used as a healthcare ID by many county councils in Sweden.[8]

The project is built on two proprietary Chromaway products. The first, Esplix, is a smart workflow middleware through which processes and workflows are encoded and enforced by the participants. The second, Postchain, is a consortium database technology which blends some of the capabilities of traditional enterprise databases with those of private blockchains. The testbed created for this project is built on ChromaWay's private blockchain network,[9] which is accessible only to authorized parties. Those parties can access the blockchain through a smart contract app that manages the transactions.[10] To prevent the blockchain from becoming excessively large, the application will store verification records of documents such as the bill of sale and purchasing contract, rather than the documents themselves, which will be held by each party to the agreement. Verification records are also summarized in an external blockchain that is transparent to the public.[11]

Users navigate the blockchain through the app, with differing interfaces for different classes of user. End users such as buyers and sellers use a dedicated mobile app, with guidance from their realtor if necessary. End users see the state of the contract and are prompted when action on their part is needed. Professional users, such as banks, realtors, and Lantmäteriet, access the contract in a professional interface, which can be integrated with their own systems and processes. Administrators at the Lantmäteriet and its technical partners administer the contract through a third interface, with changes overseen by all partners running the blockchain.[12]

In June 2016, the partner organizations developed a prototype UI and report, and began a second phase of the project in August 2016, bringing in new partners SBAB and Landshypotek Bank to build a pilot to test the business, legal and technical implications of the technology. This second phase concluded in March 2017 with the production of a report and a fully functional technical solution.[13]

By July 2017 the Lantmäteriet had begun small-scale official use of blockchain to register land and property.[14] In March 2018, it announced that it was shortlisting applicants to run trials of the first land sales and purchases on its blockchain-based platform.[15][16] So while the project has completed a proof of concept and the building of a testbed with working technology, as of mid-2018, it has not yet conducted a binding, real-world land transfer process.

"The Lantmäteriet saw blockchain as a potential solution that could improve trust by increasing the security, transparency, and accuracy of the land transfer process, allowing all parties to track a transaction digitally from beginning to end."

Blockchain Value Proposition

The intended major outcome for this project was the creation of a secure, efficient, and trusted process of land transfer that was digital end-to-end through the blockchain. The intent was to reduce the time between the signing of a contract to purchase and the registration of the property title from four months to a few days; this was to be achieved through the elimination of steps in the process and by reducing delays brought about by mail and the need for repeated checks and physical signatures. In addition, the project designers intended that the blockchain solution would increase trust in the transfer of title taking place, since all necessary information is captured by the system and visible to all parties before signing. Because of this transparency and the properties of blockchain, the process is less vulnerable to error and fraud, and all parties can keep digital records of the transaction, creating data redundancy.[17]

The Lantmäteriet saw blockchain as a potential solution that could improve trust by increasing the security, transparency, and accuracy of the land transfer process, allowing all parties to track a transaction digitally from beginning to end. In addition to its potential benefits for the Lantmäteriet, a successful solution could also be implemented for other transaction and agency types within Sweden, and in land registries throughout the world. Given that 70 percent of the world is without proper land titling, according to the World Bank, the benefits could be significant.[18]

PROJECT ANALYSIS

Risks and Challenges

The principal legal concern for moving the pilot toward broader implementation relates to uncertainty about the validity of digital signatures for real estate contracts. For a blockchain solution to function effectively, digital signatures must have full validity. Historically, Swedish law required a physical signature on real estate contracts, and although both Swedish and European law are increasingly allowing electronic identification, the legal status of digital signatures for real estate has not been established in court. Some precedents do exist that suggest an increasing legal acceptance of digital signatures. For example, in Sweden, Lantmäteriet now receives most real estate contracts in digital form, and Swedish law now allows for digital signatures on apartment leases in 2016.

The existing pilot project has a clearly defined partnership structure, involving: consulting project managers (Kairos Future), a government agency with ownership over the data (Lantmäteriet), corporate partners responsible for the delivery of the technology and blockchain solutions (Chromaway) and telecom/digital identity solution (Telia), and banks that would be involved as parties to the transactions. The eventual operation of the blockchain at scale would also involve other parties, however, including realtors, buyers and sellers, and additional technical partners supplying cloud solutions, data storage, and network capacity.[19] Frameworks for data governance and the incorporation of these parties must still be defined. Thus, scalability remains a challenge.

Next Steps and Opportunities for Scaling

As indicated, the project has already successfully undergone two initial phases — a proof of concept and the building of a testbed with working technology — but has not yet progressed to the processing of a real land transfer that would allow it to put the matter of the legality of digital transactions to the test. Nor has the technology been subject to scaling, optimization, and integration. Once a transfer has successfully taken place, the technical requirements for a launch will need to be planned, designed, and tested. These will include both digital architecture such as servers, storage, nodes for blockchain verification, and local and cloud-based storage, and processes to integrate the blockchain with systems and processes run by partners like banks and real estate agents. Once launched, the blockchain will continue to undergo process optimization.[20]

ENDNOTES

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