ANREV

Smart contracts

Introduction

In the latest edition of our series on how technology is transforming the real estate industry, we take a closer look at "smart contracts", the blockchain-based contract system which has been tipped to significantly streamline the real estate transaction process and revolutionise the industry.

What are they?

Generally a smart contract is a contract, written in computer code, that needs no external action to execute the terms of the contract. That is, once the conditions for the smart contract's execution have been met, it completes the agreed actions automatically.

To not require external action the consideration in the contract and the terms by which it is executed must all be digital so that a computer program can execute it without outside help. For example, I agree to pay you $100 if the temperature today is over 100 degrees F. For that to be executed, there must be a digital feed of the temperature that the program can access and my $100 must be in a form that can be transferred with no further instruction.

This type of contract has been technologically possible and available for many years – one need only write a program that can access a digital temperature feed and issue a transfer instruction that a bank will process. It is not that difficult, but also not very popular because there has always been the risk that someone could hack the code and make it execute differently, for example to direct payment to another bank account, or to send more money, or at a lower temperature.

The reason that smart contracts have suddenly achieved headline status is because of the emergence of Blockchain. Not Bitcoin, but the underlying Blockchain technology. That technology improves the security of the code to the point where, in theory, it cannot be hacked. This makes the whole idea of a smart contract more feasible as the code can be trusted to do what it says it will do at the right time.

Why are they important?

The main advantages of smart contracts are:

- Security;
- Transparency;
- Trust;
- Speed;
- Autonomous; and
- Enhance efficiency and cost-savings.

In terms of security and trust, blockchain provides an independent, mutually verified register of information. As long as the originating parties attest to the information and post it to a Blockchain register, Blockchain technology will ensure it is not, and cannot be, changed in any way. Blockchain is new technology, so there is no absolute certainty that it cannot be hacked. For now, and the purposes of this document, let's assume that Blockchain technology is a reliable repository for a smart contract.

There are a few challenges with smart contracts in practice. Firstly, they are written in specific programming languages. This means that you will need a lawyer who understands the specific smart contract's programming language.

Secondly, the contract will require the consideration to be available in a form where the contract can legally issue the instruction for payment so either cryptocurrency or a financial institution that will accept the instruction as compliant. There are many cryptocurrencies, and a lot of them are subject to wild fluctuations in value. There are forms of cryptocurrency that are described as "stablecoins" – their value is pegged to real money, such as the US dollar. Stablecoins have the benefits of cryptocurrency without the speculative value and may facilitate the adoption of smart contracts.

The other key requirement of a smart contact is its ability to determine if the conditions required for execution have been met. Take our temperature example; without a digital feed to temperature you rely on a human to input the value, that creates a risk of accidental or deliberate manipulation. Hence the desire for being able to test the conditions required digitally. If an external data source is required, these are called 'Oracles'. An Oracle is an external source that confirms if a condition has been met. The risk with an Oracle is that they can be misinformed, they can forget (if they are human), they may accidentally cause an error when processing data or they may choose or be forced to deliberately provide incorrect information.

Where every condition can be tested digitally and by reliable, known and trusted sources, then the contract can be relied upon to execute correctly.

In addition to the security benefits mentioned above, stakeholders hope that smart contracts will save time and money by both speeding up the process of completing and administering contracts, as well as limiting the number of intermediaries involved in the process (therefore reducing fees and costs). Practical examples of how this may work include:

- Automatic e-signatures built into the blockchain contract – saving the time of having to find a wet ink signatory.
- Immediate bank transfers – removing intermediaries to reduce time (and save fees), but retaining security through the blockchain model.
- Centralised record of transactions – improving data control and management, and potentially improving financial reporting and auditing.
- Improving processing of service contracts that sometimes require large numbers of individual work orders to be approved.

How can they benefit Real Estate?

The benefits to the real estate sector are likely to be increased security and trust, and improved efficiencies leading to lower costs. However the real estate sector is often charged with being behind the times, and so arguably real estate has more to gain than other sectors looking to benefit from smart contracts.

In the real estate space, a classic example would be where title is transferred. Confirmation of this condition being met, in most cases, requires an Oracle. There are a small number of places where the land register has been digitised and is held on a blockchain. However, in most cases, the transfer of ownership is represented by a piece of paper and a smart contract needs a human to confirm the existence and authenticity of that piece of paper before it can execute. So, in a small number of places, a smart contract can complete a land sale transaction, which saves a lot of paperwork and time. This is one reason why there is a lot of attention to this initiative.

This initiative was recently trialled by the UK's Land Registry, who successfully completed the UK's first digitised end to end residential property transaction. The Land Registry spent a number of months developing the blockchain prototype, in conjunction with other stakeholders from the property market including a real estate bank, a digital payments company, a digital identity company (for ID and anti-money laundering checks), and legal advisers.

Whilst this prototype took months to develop , and the "completion" event (title transfer) was demonstrated on a video conference with 9 attendees, the intention is that the technology will be developed so that completion can occur instantaneously (once the contract "conditions" have been met), and the whole process will be streamlined to enhance security and efficiency.

Smart contracts could change the roles or even take the place of certain professionals within the deal process. For example, during the early stage test runs of blockchain-supported smart contracts escrow agents have been replaced by the automatic transfer of currency via a blockchain escrow function built into the smart contract itself, once all conditions agreed by the parties were satisfied.

In time the steps to complete a simple property transaction could be condensed to a matter of days (if not hours!), and could look something like this:

Case Study: Land Registry (step by step guide)

STEP 1 — Buyer identifies a property using online listing service

STEP 2 — Parties agree commercial terms of the deal

STEP 3 — Parties login to block-chain-supported platform hosting the transaction, and enter their private transac-tion key which is verified by the smart contract

STEP 4 — Purchase agreement is drafted automatically

STEP 5 — Identities and KYC details of the parties are verified using an online system built into the smart contract

STEP 6 — Parties sign the purchase agreement using an electronic signature created by the smart contract

STEP 7 — Once all conditions are satisfied, completion monies (in the chosen currency) automatically transferred to the seller

STEP 8 — Transaction is recorded in the smart contract, whilst storing a soft copy of the purchase agreement

STEP 9 — Relevant land title register is automatically updated to reflect change of ownership

In addition to purchase and sale agreements, other examples in the real estate industry where Smart Contracts could make a difference include:

RENTAL AGREEMENTS

Tenant ID checks, tenant credit checks, deposit payments, initial rental payments, and contract settlement could all potentially be digitised and completed on a blockchain smart contract.

SERVICE CONTRACTS

Service contracts can have complex service credit clauses linked to service level performance. The ability to aggregate data from actual work completed and compare that to targets and then compute a score and service credit payment is a labourious task that has errors and takes more time than it should. Automating this and providing certainty to the outcome would reduce risk premiums and ensure transparency on service levels.

COMMISSION AGREEMENTS

Real Estate Agents often have challenges with getting commissions paid as other parties seek to reduce their costs. Providing certainty and transparency will speed the process and allow agents to focus on the job rather than getting paid.

SERVICE GUARANTEES & WARRANTIES

Any type of promise for future action that is contingent upon a condition being met such as equipment failure could be the subject of a smart contract as long as the challenge of an independent Oracle can be overcome.

FACILITIES MANAGEMENT & SERVICE CHARGES

Invoices can be processed, payments made, and service charge regimes administered automatically under a blockchain contract model. Disputes and complicated matters can be reserved for human review.

INSURANCE CLAIMS & PAYOUTS

For real estate related claims (e.g. property damage, incidents occurring on landlord's property), claims can be approved/ rejected, and payouts automatically made, if predetermined conditions are met. Higher value and/or complex cases can still be dealt with manually.

What should you do next?

As an emerging area with ever-improving technology, there is a lot of speculation about the current and potential impact of smart contracts. Some expect we will be able to do away with lawyers. In our view, that's not the case; smart contracts require lawyers who can understand how to build and test them. Whilst many hold the long term view that transaction costs will hopefully be reduced by smart contracts, in the short term costs might initially go up whilst the technology is developed and processes are refined.

To eliminate the Oracle problem, smart contracts will rely on digital data sources. IoT devices and data sources will be a key part of doing this, so increasing sensors and their connectivity in buildings will help enable some more complex types of smart contracts.

The nature and form of smart contracts may well change as experience grows. Real estate professionals should watch to see how the technology evolves as the true benefits scope of applications are not yet fully known.

If members have any questions, or require a more detailed explanation of any of the points referenced in this note, please contact the ANREV Technology and Innovation Working Group at the following email address: wg-tech-and-innov@anrev.org