BUDDLE FINDLAY

Smart contracts - what are they and what difference could they make?

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One of the hot topics in the technology space at present is blockchain technology which has been heralded by some as the greatest invention since the internet. A blockchain is the technology that underpins bitcoin but in fact it has much broader application. It is essentially a distributed database held on multiple computers that maintains a continuously-growing list of data records which cannot be easily tampered with.

In January the UK's Guardian newspaper asked the question "Is Blockchain the most important IT invention of our age?" (see here). Global players are now investing significant funds in the technology (see here for example).

A lot of the hype about blockchain has involved the ability to create what are called "smart contracts". However, there seems to be a range of opinions about what a smart contract is exactly. Most commentators seem to agree that smart contracts involve:

- Programs that define a set of rules such as "if A happens, then do B"
- Those rules (and the execution of those rules) are stored and replicated on a blockchain – a network of computers which together create and maintain a ledger
- The rules facilitate the automated performance of a set of contractual obligations without the need for human interventions
- As the obligations are performed, the blockchain is updated (eg to show payment or the transfer of assets).

A good description can be found on Antony Lewis' blog here.

There are lots of potential applications and a number of companies working on them. Examples could include:

- Trade finance arrangements
- Insurance contracts
- Escrow arrangements.

One of the best examples can be found on Nick Szabo's blog here. Szabo uses the example of a car which could be programmed so that:

- The car will unlock for the owner only
- There is a back door to let in a creditor who wants to repossess the car if it isn't paid for
- The creditor's back door terminates once final payment is made.

It's easy to see that if aspects of contracts (in particular relating to their execution) could be automated using a blockchain there could be significant advantages, including:

- Decreased transaction costs
- Cutting out the middlemen (eg banks, escrow agents, even (gulp) lawyers)
- Security – these systems may arguably be harder to cheat as multiple computers are involved in maintaining the blockchain and transactions can be set up to require the use of multi-signature addresses.

However, in my view, it's a bit early to claim that *smart contracts* will lead to an end of the need for lawyers or will supplant traditional contract law and its enforcement. For this to happen there are some pretty tricky issues which would need to be overcome including:

- **Disputes:** How should disputes be addressed? They could emerge because a party refuses to recognise the validity of a smart contract or argues that the automated system has worked incorrectly. Even if the smart contract could call for some form

of non-court dispute resolution process that courts would recognise (eg arbitration), how would this work across jurisdictions? If courts do need to become involved, will they be able to apply principles of contractual interpretation to code?

- **Transparency:** Blockchains generally involve a level of transparency. But what if the parties don't want all the details divulged? How do you keep some data about the contract private while keeping the other benefits of the blockchain?
- **Immutability:** How do you unwind transactions that shouldn't have happened (eg if there has been duress or it is a contract with a minor or a contract that is for some reason (or is somewhere) illegal or in breach of regulatory requirements)?
- **Coding for the unknown:** Contracts, particularly the more complicated contracts which have future-looking obligations, often attempt to deal with the unknown and have clauses that aren't obviously and easily reduced to code that can execute automatically as a simple "if this, then that" lock-step procedure. A force majeure clause (dealing with what happens if there is an "act of god") is an example.
- **Liability:** If something does go wrong with the execution of the contract and someone suffers a loss, who do they go to for recourse? With a distributed ledger system it could be difficult to work out where the problem happened and who caused it, let alone pursuing that person for compensation.

While the rise of wider use of blockchain technology is unlikely to lead to the end of written contracts any time soon, just as developments such as website terms and conditions, click-wrap and shrink wrap agreements, and even vending machines, have made certain contracts easier to enter into and perform, using a blockchain to create smart contracts could lead to some quite revolutionary changes in how parties contract with each other.

This article was written by Amy Ryburn, partner in our TMT team, for the IITP Techblog (5 May 2016). The original article can be found here.

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