

Smart contracting technology is ready for use

Tracey Summerell and **Mark Macaulay** of **Dentons UK and Middle East LLP** analyse the obstacles to smart contracts being widely adopted in construction. The reality of smart contracting may be closer than you think, they suggest.

KEY POINTS

- Using 'new tech' is becoming more widespread in the construction industry
- However, the use of 'smart contracts' to automate contract processes has not yet gained traction in construction
- A recent survey sheds light on some of the reasons for the industry's doubts and concerns
- Smart contracting could help address some of the problems giving rise to disputes
- The process and status of smart contracting raises various legal questions

New technology is driving change in all sectors of the global economy. The construction industry is no different, if a little slower on the uptake than some other sectors. BIM has government backing and is widely used, and bodies like the Construction Industry Training Board (CITB) are actively researching the scope for a digital future which includes the use of drones, 3D printing, automated vehicles, artificial intelligence (AI) and data analytics. (See 'Unlocking construction's digital future: A skills plan for industry'.)

However, knowledge and skills about digital contracts are lacking throughout the industry, as acknowledged by Steve Radley (CITB policy director) when the CITB report was issued in October 2018. The practical, technical, commercial and legal issues involved in switching from traditional to 'smart' contracts are complex and relatively new. These challenges are off-putting and verging on 'sci-fi' to most, but the reality of smart contracting is closer than you might think.

So what are smart contracts?

In a recent lecture on smart contracts and English law (www.liverpool.ac.uk/law/news/stories/title,1140933,en.php, May 2019), the Chancellor of the High Court, Sir Geoffrey Vos, gave the following definitions of a smart contract: (i) a set of promises, specified in digital form, including protocols within which the parties perform on these promises (from the writings of Nick Szabo); and (ii) a recording of a legal agreement between parties that is written in a language that is both human-intelligible and machine-readable, whose text incorporates an algorithm which automates some or all of the performance of the agreement (Dr Jason Allen, Sir Geoffrey's former judicial assistant).

In a smart construction contract, 'blockchain' technology could be used to implement the terms of and administer the contract and its costs. Blockchain is a digital means of recording transactions on a distributed ledger. It moves assets by linking records together in a chain and making them secure using cryptography. The records are continuously shared between the ledgers and reconciled irreversibly across a computer network, which effectively means that the records are trustworthy and no third party intermediary agency (like a bank) is needed.

Using blockchain technology, a smart contract could be created to collate and process information about the progress of the project, and apply the agreed contract terms, as translated into code, to execute specified actions, such as payment. Technology (such as a drone or a data capture app) could be used on site to record a variety of information, such as the moment that site workers 'clock on', progress on the build, weather conditions and the arrival of materials. These records would be fed into the smart contract which would then, automatically, check the next step in accordance with the contract's terms as coded and trigger an action (for example, an automated

payment at a certain milestone).

Smart contract and related technology could, therefore, make key features of current construction contracts redundant, including the need for contract administrators, payment notices, project bank accounts and the opportunity to only 'pay when paid' – all administration could be implemented through the smart contract.

The flaws in our current contracting processes

The use of standard form contracts is firmly entrenched in the construction industry. We choose the appropriate form for the project, negotiate to ensure the terms suit the parties' needs, allocate risk, include relevant design and programming information, agree those terms and get started with various key players in place to administer the contract. The flaws in this process, which make disputes more likely, are widely acknowledged – over-complex and time-consuming negotiation and significant, routinely-made amendments which increase the scope for consequent contractual ambiguities and increase the risk of disputes.

Might smart contracts improve the process? This was considered by Jim Mason (Associate Head, Built Environment Programmes, Department of Architecture and Built Environment, University of the West of England, Bristol) and Hollie Escott (Quantity Surveyor, Wessex Water) in their report: 'Smart contracts in construction: Views and perceptions of stakeholders'. The report considers whether smart contract technologies already used in other sectors, such as the financial services sector, can be transposed to the UK construction industry. The authors review their survey results on industry attitudes to technology and highlight some of the issues to be addressed before smart contracts can become an everyday reality for construction. Not surprisingly, the authors' survey revealed overwhelming doubt from participants that full automation is possible.

What are the practical issues for construction?

The Mason/Escott report flags up a number of issues:

- ◆ How would smart contracts operate in the construction sphere?
- ◆ How far could the use of smart contracts extend and how would their use fit with and support the industry's collaborative agenda? How do we deal with the inevitable upheaval of introducing an automated process?
- ◆ How do you manage this change within the

industry – especially when the survey results indicate that older generations are concerned about the loss of specialist knowledge on contracting processes and the loss of skills?

- ◆ Would the 'new tech' itself cause disputes? Are humans needed to resolve disputes? Or, is there scope for smart contracts to create trust, standardise contracts, improve quality and reduce administration and disputes? Smart contracts might reduce the scope for differing contractual interpretations – but they would also cut out middlemen administrators.
- ◆ Will smart contracts cause job losses in the industry if administrators are not needed?
- ◆ How do you automate construction contracts anyway – are they not each unique?
- ◆ Will the use of smart contracts affect the build-up of trust during the construction process? Or will it require parties to invest more heavily in building trust and collaboration at the outset of the construction process?
- ◆ Should we consider semi-automation as a compromise? This would involve automating those elements of construction contracts that involve repeat and severable processes, while leaving humans to address intractable issues such as dispute resolution.

Forcing a long-sought-after change of culture?

Setting up the coding for smart contracting would force the construction industry to focus on recurring, industry-wide problems (for example, late payment). Introducing a smart contract on a project would require the parties to accept a robust timetable for payment with no one party having control of the cash flow as employers/contractors have now (arguably there would be no need for deductions as payment would be based on automated measurement, thereby removing another source of dispute from the process).

A shift in contracting culture and approach would be needed. Market leaders would have to set the pace and commit the resources for training. However, before committing to such investment, they will require reassurance that smart contracts are legally binding and capable of being enforced.

The legal issues in using smart contracts

The legal issues associated with developing smart contracts, artificial intelligence and associated technologies are being considered by the UK Jurisdiction Taskforce (UKJT), one of six taskforces

created by the LawTech Delivery Panel (LTDP) whose remit is to help the UK legal sector 'grow and fulfil its potential'. (The legal profession, similar to construction, recognises that technology (including smart contracts) is a key component in the future success of the UK's jurisdiction and economy. (Source Law Society website.))

Part of the UKJT's remit is to coordinate the preparation of a legal statement on the status of cryptoassets, distributed ledger technology (DLT) (such as blockchain) and smart contracts under English private law, as well as to highlight areas of uncertainty that require clarification.

The UKJT is currently involved in a consultation process and issued a consultation paper in May 2019 which set out the following key issues:

- ◆ Do contracts written in code need a legal framework? (Some coders think not, but investors might have more confidence if a framework existed.)
- ◆ Are cryptoassets 'property' in English law, capable of constituting security or giving rise to binding legal obligations?
- ◆ Does the well-developed, flexible English common law system already have sufficient foundation to govern the status of cryptoassets and smart contracts? If not, which areas are uncertain?
- ◆ How might rights under a smart contract be enforced?
- ◆ How would the English law of contract interpretation be applied?

Sir Geoffrey Vos, a UKJT member, lectured on some of these issues earlier this year (see 'Cryptoassets as property: how can English law boost the confidence of would-be parties to smart legal contracts?'). His view is that English law is in a good position to provide the necessary legal infrastructure – but only if the necessary reforms are kept simple. He reviewed some of the case law and legal issues which the forthcoming legal statement will cover, including:

- ◆ How would an English court apply general principles of contractual interpretation to a smart legal contract written wholly or in part in computer code?
- ◆ Under what circumstances would an English court look beyond the mere outcome of the running of any computer code that is part of a smart legal contract in determining the agreement between the parties?

- ◆ Is a smart legal contract between anonymous or pseudo-anonymous parties capable of giving rise to binding legal obligations?
- ◆ Could a statutory signature requirement be met by affixing a private key (very broadly speaking, a key used to decipher encrypted messages)?

Could a statutory 'in writing' requirement be met in the case of a smart legal contract composed partly or wholly of computer code? Sir Geoffrey's preference would be to use legislation to remove the fundamental legal impediments to smart contracts and then deal with the other issues under the common law (not least because it would take too long to create an entirely new statutory regime). Others doubt that the common law is up to the task. Without pre-empting the content of the legal statement, he envisages legislating to: (i) make a cryptoasset displaying basic common features into property in English law; and (ii) ensure a smart legal contract composed wholly or partly of computer code is capable of constituting a valid binding contract under English law.

Other issues could be dealt with by including appropriate provisions into the coding. Some coders believe that intermediaries, including lawyers, will not be needed when setting up smart contracts. Sir Geoffrey disagreed – lawyers must persuade the coders that smart contracts must be built on a strong legal foundation. Lawyers need 'to address the misunderstanding that the law does not apply to these new technologies in a borderless environment ...' Potential users need to be confident that they will 'be able to invoke legal remedies in appropriate circumstances'.

Dispute resolution provisions must be built into smart contracts to enable resolution of errors and misrepresentation in the coding process, not least because coding requires human input and all human activities are susceptible to mistakes (and misrepresentation/fraud).

The future?

Smart contracting is new territory for most businesses and their contracting teams. They face a steep learning curve. However, the technology for converting discussion into practice exists. We are already at a point where parties could agree to automate elements of construction contracts using coded smart clauses. (See, for example, the technology offered by Clause: <https://clause.io/company>.) The future is closer than we think. **CL**