Adopting smart contracts in construction: what are the practical and legal issues?

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The construction industry is starting to engage more widely with new and emerging technology like Building Information Modelling, drones and 3D printing. Various bodies are now working on the multitude of challenges that implementation of such "new tech" poses for the industry.

However, not as much attention has been given to the digitalisation of construction contracts. That is starting to change.

Current contracting

The use of standard form contracts is firmly entrenched in the construction industry. We have long-established contracting procedures. We choose the appropriate form for the project, negotiate to ensure the contract terms suit the parties' needs, allocate risk and include relevant design and programming information, agree those terms and get started with various key players in place to administer the contract. However, the flaws in this process - which make disputes more likely - are widely acknowledged.

In their recent paper, "Smart contracts in construction: Views and perceptions of stakeholders", Jim Mason and Hollie Escott highlighted dissatisfaction with current contracting processes, the over-complex/time-consuming process of negotiation, the widespread amendment of standard forms and the scope for consequent contractual ambiguities that increase the risk of disputes. Together, the authors reference the use of smart contracts in other sectors and gave an insight into the future were the construction industry to use smart contracts. Mason and Escott:

- explain that smart contracts and blockchain technology are "at the forefront of technological advancement in the financial services industry. The basic premise involves the creation of an automated contract capable of satisfying common conditions and reducing the need for intermediaries in the process. The blockchain is a means by which the transactions can be recorded on a distributed ledger";

- discuss whether these technologies can be transposed to the UK construction industry – and whether that is a desirable outcome;

- include and review the results of their survey into industry attitudes to technology and collaborative working; and

- highlight some of the issues the industry needs to address before smart contracts can become an everyday reality for construction. Not least amongst those issues is the need to raise industry awareness given that "key findings reveal[ed] a fear of the unknown and the overwhelming doubt from participants that full automation is possible".

So what are smart contracts?
In a recent lecture on smart contracts and English law, the Chancellor of the High Court, Sir Geoffrey Vos, gave the following definitions of a smart contract:

- a set of promises, specified in digital form, including protocols within which the parties perform on these promises (from the writings of Nick Szabo);

- 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. It could collate and process information about the progress of the project, and, subject to the agreed terms as translated into code, execute a specified action.

Technology 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 payment notices, project bank accounts and the opportunity to only "pay when paid": all could be monitored and administered through the smart contract.

What practical issues does smart contracting raise for construction?

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

- How would smart contracts operate in the construction sphere? (We are not simply talking about document automation here.)

- How far could the use of smart contracts extend and how would their use fit with and support the industry's collaborative agenda? After 20 years of industry focus on collaboration, 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 indicated 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 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
Forcing a long-sought-after change of culture?

Setting up the coding for smart contracting will also 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.

A shift in culture and approach would be needed. Market leaders would have to set the pace and commit the resources for training.

The legal issues in using smart contracts

The legal issues that arise in setting up smart contracts require extensive consideration too.

Sir Geoffrey Vos, a member of the UK Jurisdiction Taskforce tasked with developing smart contracts, artificial intelligence and associated technologies, lectured earlier this year on key legal issues relating to smart contracts. A key issue is whether we should rely on the common law to effect the required changes – relying on the courts to gradually iron out the legal issues via dispute resolution. Or should a new legal code be introduced from the outset to deal with smart contracts?

Sir Geoffrey favours the latter as a means to answer some/all of the key questions, including:

- What remedies will be available to users of smart contracts when things go wrong?
- Is a smart legal contract capable of giving rise to binding legal obligations, enforceable in accordance with its terms?
- Could a statutory signature requirement be met by affixing a private key?
- Could a statutory "in writing" requirement be met in the case of a smart legal contract composed partly or wholly of computer code?

Will lawyers even be needed?

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 with built-in dispute resolution provisions. 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".

Built-in dispute resolution is essential to resolve 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).

Sir Geoffrey thought that English law could provide the necessary legal infrastructure to facilitate smart legal contracts...
but it is essential that future reforms (such as the introduction of a code) are kept simple.

The future

The range of legal and practical questions about how smart contracts will operate is daunting. However, the rewards of securing a mechanism for the smooth and more efficient running of complex projects must surely be enough to tempt investors and the government to invest in finding the answers.

Learn more – smart contracts panel session in autumn 2019

We are organising a panel session in late autumn to discuss smart contracts. Authors Jim Mason and Hollie Escott will join the panel along with others in the industry.

Get in touch with one of the Key Contacts if you would like to receive an invite.

"The impact of digitalisation in rail is only just beginning…'"

You might also be interested in our Dentons' Autumn Rail Series 2019: “The impact of digitalisation in rail is only just beginning…”.

The Dentons Rail team will look at the digitalisation of rail including the rise of the Internet of Things (IoT), Big Data, Smart Assets and Artificial Intelligence in rail. Every business is being impacted by digital advances, and digitalisation is only just beginning for the rail sector. This seminar will explore how digitalisation is being used to deliver cost reduction and service improvements for the rail industry.

This event will be of interest to all those involved in the UK transport and infrastructure sector, including infrastructure managers and train operators.

This event will take place on Tuesday 24 September 2019, 8.30am – 10.30am. To attend, please register here.

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