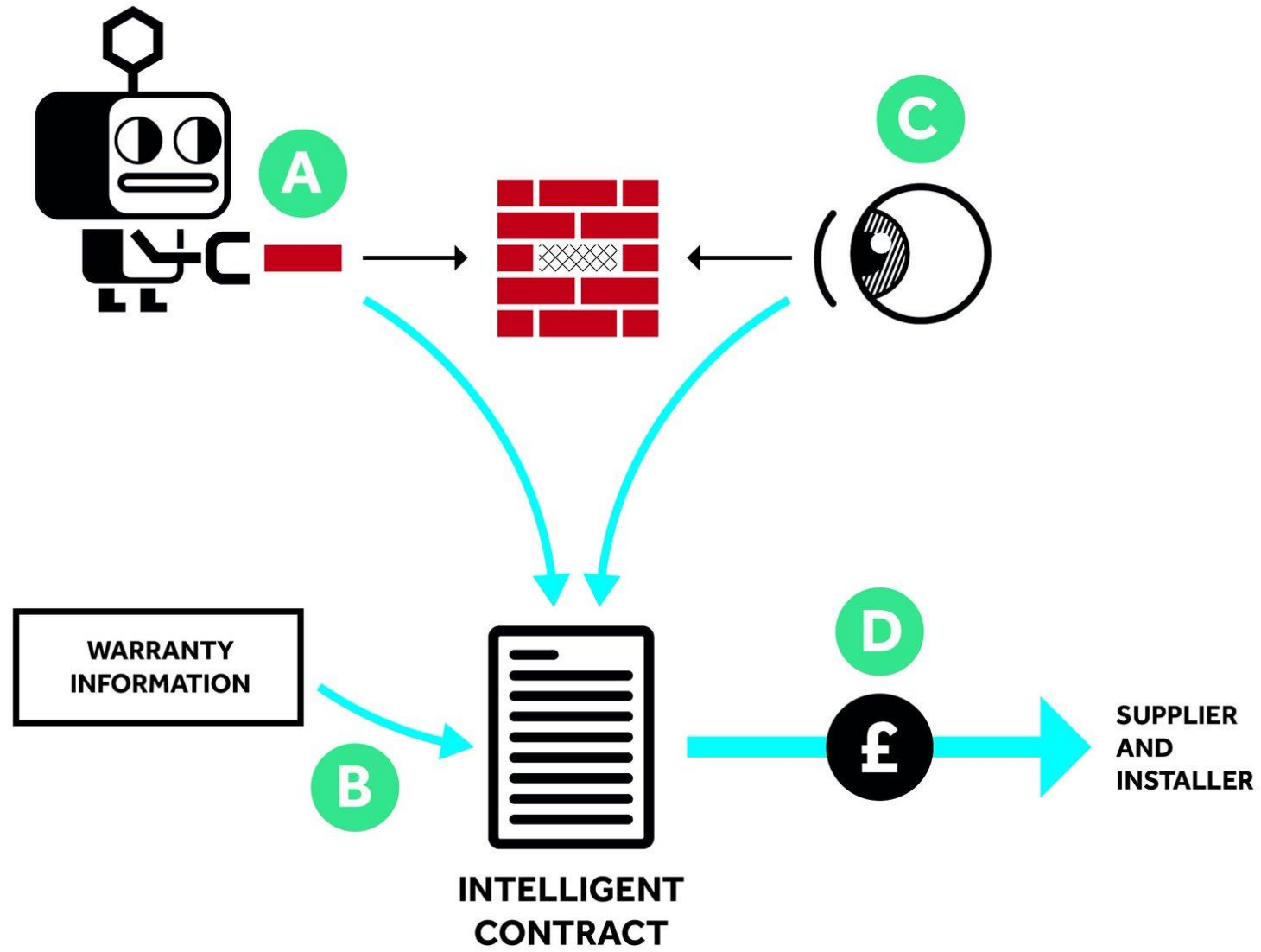


NEC in Hong Kong The Legal Landscape and Beyond

Dr Jim Mason, UWE Bristol, UK

Predicting is hard, especially about the future (Yogi Berra)

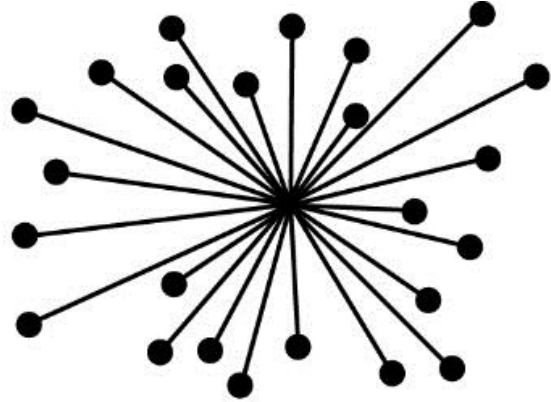


$$A + B + C = D$$

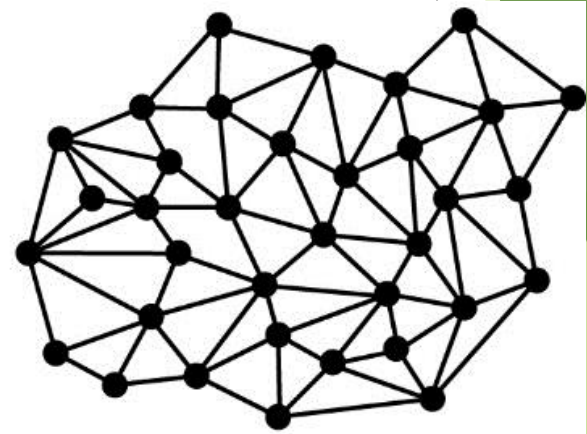
Progress



Linear



Hub and Spoke



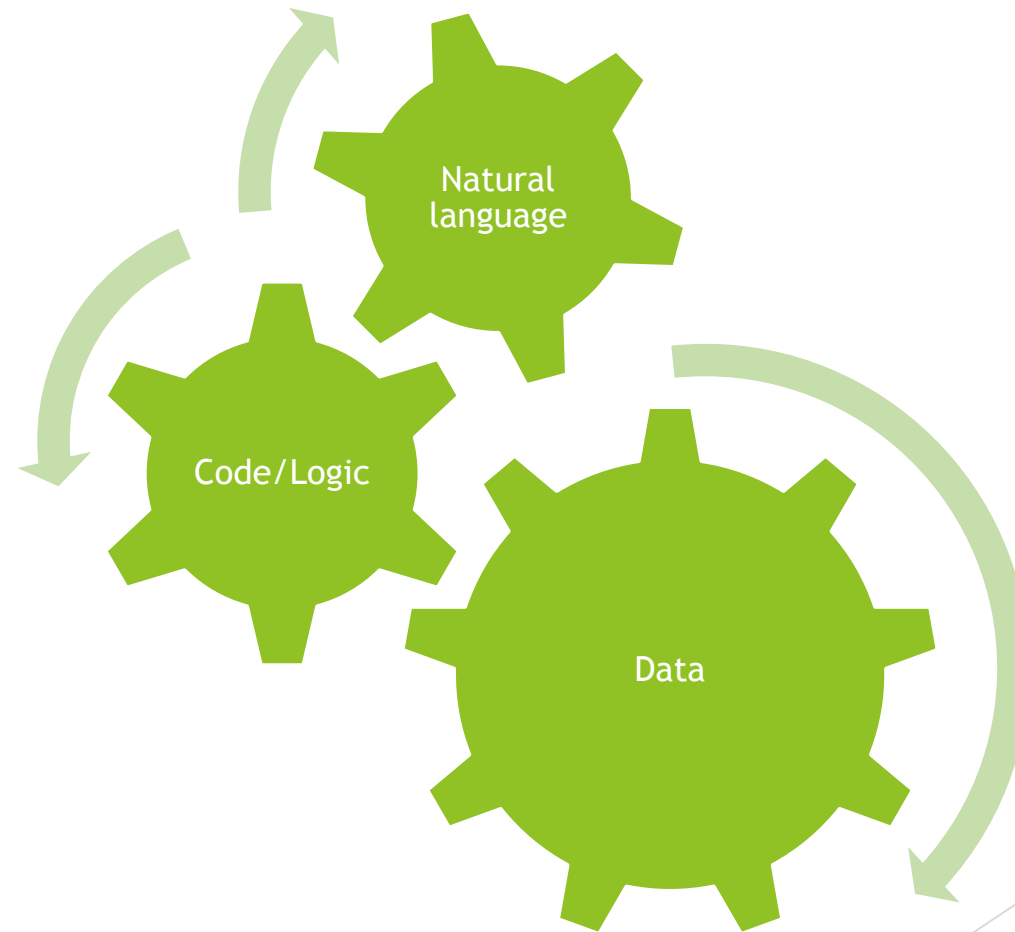
Stigmergic

JCT NEC FIDIC

PPC2000 NEC4 FRMK

SMART CONTRACT

Components of a Smart Contract



Connected
trustworthy

self-executing

responsive

Natural Language

- ▶ Meaning
 - ▶ Trust and transparency
 - ▶ Regulated by legal norms
 - ▶ Focus of a statutory regime
 - ▶ BIM Protocol
- ▶ *Party A will pay Party B the sum of X per unit upon satisfactory execution of the obligation as certified by C*

Code/Logic

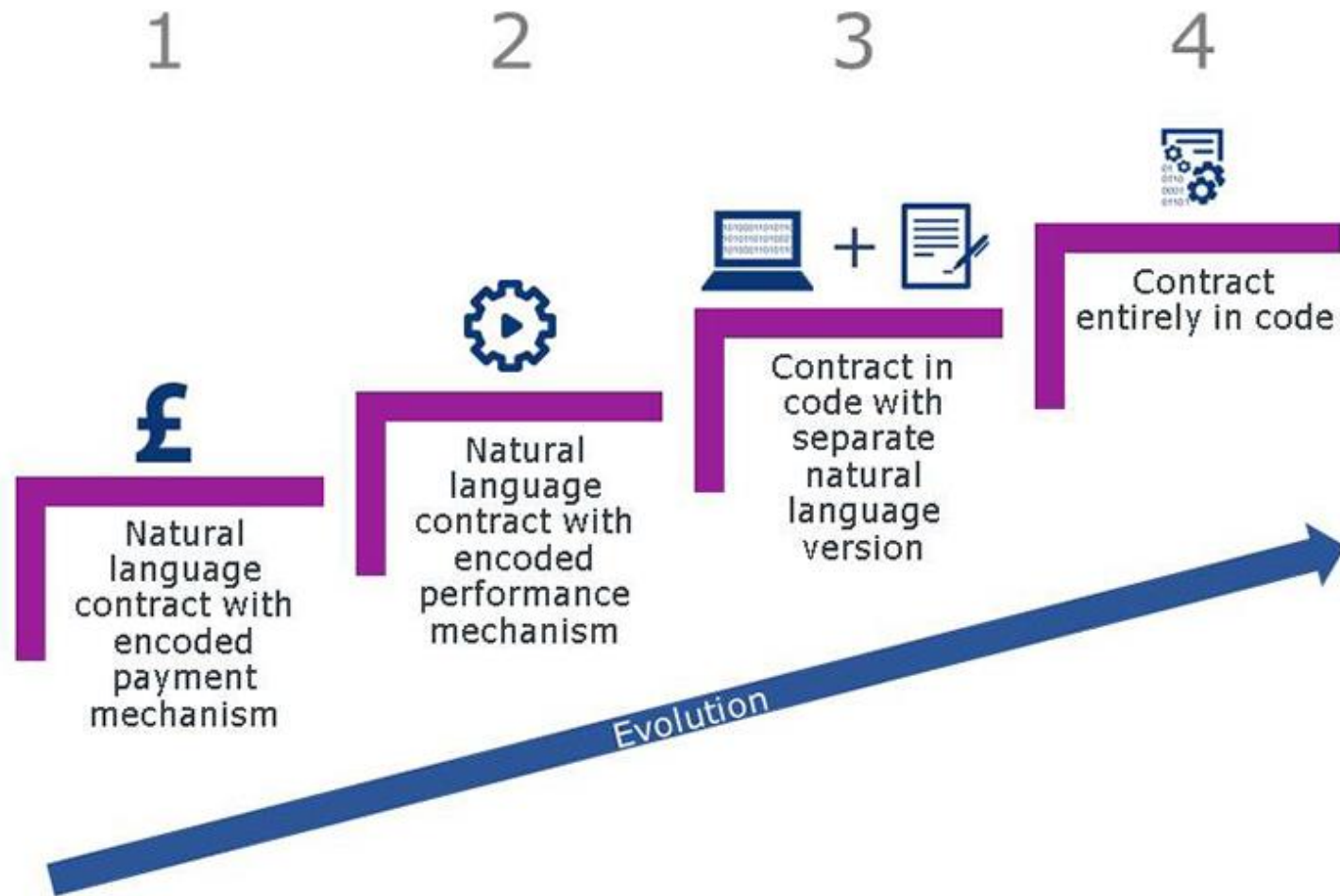
- ▶ Computer language readable by machines
 - ▶ Code is Law and Law is Code
 - ▶ Accord Project ERGO both natural language and code
- ▶ 100101010101010101010101010101010101110101010101010
 - ▶ 10 PRINT FGR ARE THE BEST
 - ▶ 20 GOTO 10

Data set

- ▶ BIM model in use starting point
- ▶ Internet of Things
- ▶ Interested in the transaction **NOT** the contract

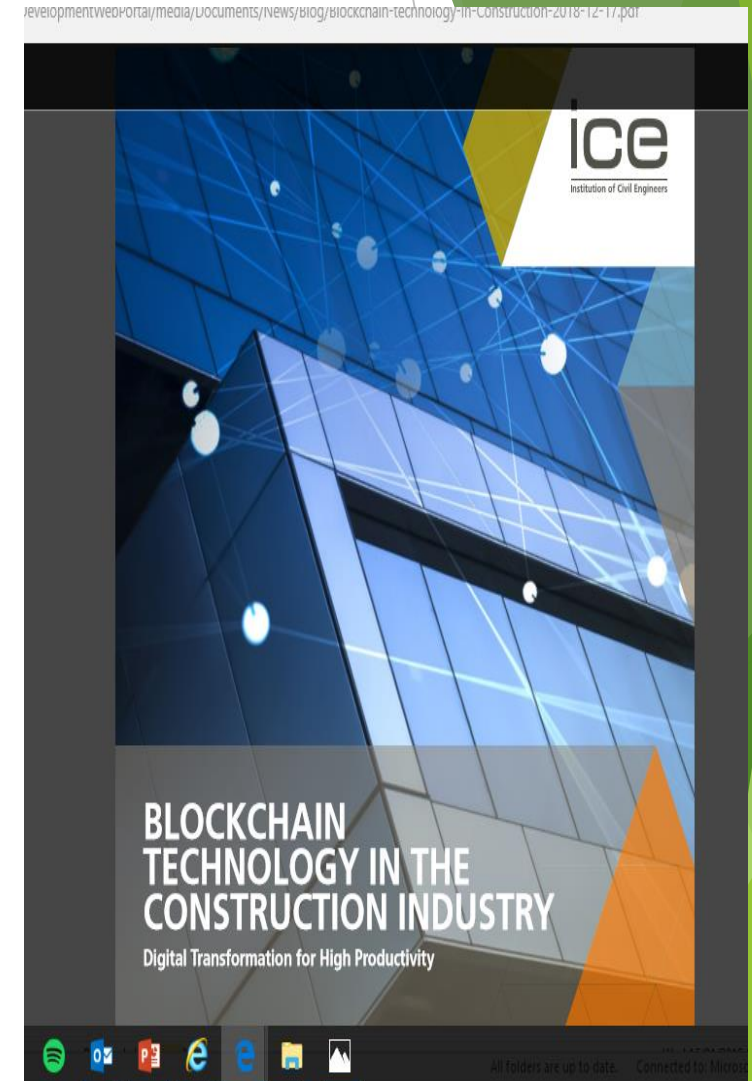


Smart Contract Evolution



ICE Blockchain Technology in Construction - December 2018

- ▶ 1000 applications - only one is bitcoin
- ▶ Distributed ledger technology
- ▶ Replaces 3rd parties
- ▶ State of the Art summary





TRANSPARENCY

TRACEABILITY

COLLABORATION

Sensors and collaborators on site informing smart contract

Oracle/collaboration sensors



Smart Contract and Blockchain



Client updates



Conclusion - need to make toddler steps

- ▶ PAS333
- ▶ BIM FM
- ▶ Hyper ledger fabric
- ▶ Enterprise Blockchain
- ▶ DocuSign



Smart Contracts and Collaboration

Notes Prepared for “NEC Contracts in Hong Kong, the Legal Landscape and Beyond.” June 2019

**Dr Jim Mason, Associate Head Built Environment Programmes University of the West of England,
United Kingdom**

Yogi Berra once said that *“Predicting is hard, especially about the future”* This joking truism counsels caution and a wait and see approach to what develops. This is particularly sage advice in the fast-paced world of technological innovation. However, part of the role of an academic is to predict and help to prepare the ground. The possibilities for new approaches to be adopted in the construction and engineering sectors currently feels limitless. Consequently these are interesting times. This is partially because many of the innovations and initiatives are already commonplace in other industries. The leaders of today should therefore be exhorted to look to windward and set a course to deliver the improvements for which the construction industry has been crying out for during the last century. A better way now appears within reach through the medium of smart contracts and enhanced collaboration.

A smart contract binds natural language text to computable code via a data model. The benefit is to deliver automation, or at least semi-automation. Taking these components in turn:

1. Natural language text – our legal system is based entirely on the contract wording to deliver certainty and allow our statutory and common/civil law regimes something to fix on. We, as humans, need to trust and understand the undertakings being exchanged. Ultimately, the words will not be needed as the focus moves from the contract to the transaction itself.
2. Computable code – Computer code and law are not so very different. Both express “logic” and need to be understood to be of use. The only real difference is that one is readable by a lawyer and one by a programmer. The Accord Project, which held its inaugural conference in the City of London in June 2019, is seeking to establish a language and a set of templates that are readable by both.
3. The data model – this can be planned and actual as an internet of things approach updates the model in real time. Essentially, each component of the build becomes its own mini-contract (think inchstone rather than milestone). The natural starting point for data programming and extraction is the BIM software. This requires construction clients to finally appreciate that the value of the model is not only in the construction phase but much more so in the facilities management phase. The model can become the nerve centre for the building’s performance and contribute to making it more sustainable in its use and maintenance.

The net effect of having these three components in one artefact provides a framework for constructing a building or civil engineering project. The sheer volume of mini-contracts being executed and performed probably means the involvement of a blockchain or similar distributed ledger technology. People naturally associate blockchain with crypto-currency and conjure images of a lawless wild west-style volatile commodity. Crypto-currencies represent only one of a thousand uses for blockchain that includes uses as varied as tracking shipping containers around the world and a system of food

provenance allowing perishables to be traced back to their farm of origin. The complexity of a building project would not phase such a sophisticated and vast resource as blockchain technology.

Collaboration is the other potential saviour of the construction and civil engineering industries. The sector has been implored for many decades to improve its attitudes and to end the adversarial approach. The reality is that disputes are as rife as ever. Positive and productive relationships are routinely burned as a consequence. The latest development in this area is the Framework Alliance Contract (FAC-1). This contract innovation shows great promise in delivering lasting results. One of the features of the agreement is that it is standard form agnostic in that it can sit alongside any underlying contract type. This standardisation of approach is mirrored in the smart contract whereby there is no need to individually negotiate or amend the agreement.

A survey a few years ago of final year quantity surveying students at UWE Bristol revealed a baffling outcome to a question. When asked whether they would prefer the construction industry as it is now – red in tooth and claw – or collaborative, they chose the former. I repeated the exercise more recently substituting “collaborative” with “digitally enhanced” and the response was overwhelmingly the latter. Therein lies the paradox. Most professionals are aware that the collaborative approach has huge benefits but nevertheless remain sceptical at least until they have seen it work. However, no one wants to stand in the way of progress. The message for the legal community is also clear and becoming involved and finding out more about the new initiatives makes perfect sense. There is a particular need for lawyers in this field to re-assure their clients that their interests are protected and to facilitate the development of the law in its regulatory role. The rewards on offer, in terms of finally ridding the industry of its poor reputation as a wasteland, are extremely worthwhile.