The impact of distributed ledger technology on trading, finance and insurance

Date and Location: 25th April, 2018 at The Royal Society

Chair: Sir Anthony Cleaver HonFREng
                                     The Foundation for Science and Technology

Speakers: Chris Corrado
                                     Group Chief Operating Officer and Chief Information Officer,
                                     London Stock Exchange Group

                                     Shirine Khoury-Haq
                                     Chief Operating Officer, Lloyd's of London

                                     Dr Mike Short CBE FREng FIET
                                     Chief Scientific Adviser, Department for International Trade

Panellists: Keith Bear
                                     Vice President, Global Financial Markets, Global Markets, IBM

                                     Tim Smith
                                     Consultant, Credit Suisse

Sponsors: The BRE Group, The Institution of Engineering and Technology,
                                     The Knowledge Transfer Network, The Alan Turing Institute and
                                     Willis Towers Watson

Audio Files: www.foundation.org.uk

Hash tag: #fstdistributedledgertechnology

CHRIS CORRADO said that Distributed Ledger Technology (DLT) and Blockchain had helped the London Stock Exchange gain synergies across its business since 2015. Use of these technologies, both internally and externally with customers, had reduced error rates and improved cost structures. Important progress had been made using Hyperledger, in partnership with IBM, by eliminating the need for reconciliation between data stores. It had not yet been used in production, and there were challenges with scalability.

Some trials with customers had worked well, and others had not been taken to completion. It was valuable to experiment with customers; usually such trials ran for up to eight weeks, though there could also be useful learning from trials which failed fast. Typically external customers wanted to trial interfaces to their own technology. It was also valuable for regulators to be educated about DLT. Openness with regulators, and demonstrating solutions to integrity issues, was key.

In the early stages some technology companies had wanted handouts, but the London Stock Exchange did not want to operate as a venture capital investor. It did however think it valuable to invest time in learning from technology piloting. As

products had matured they had become more scalable and reliable; but resilience remained an issue. Now products needed to support decentralised consortia; these were likely to be open source based but with proprietary features. With maturity, settlement times were reducing, as well as IT costs. There were opportunities in tokenisation, which was regulated differently in the US.

In the future the London Stock Exchange saw opportunities through DLT in the digitisation of bonds and equities for smaller companies, making capital raising lower cost for such companies. Post trading, there were opportunities in instant settlement times and in reduced effort in trade reconciliation. They would continue to operate in DLT consortia, both Hyperledger and the PTDL Group, and offering flexible DLT expertise would be essential to retain customers. Looking ahead, DLT's best opportunities were in providing new infrastructure where none existed at present. Replacing existing infrastructure would continue to be a long road. DLT and Blockchain were still too young to focus on one dominant player. Although developments remained fast paced, consistency would be key. The London Stock Exchange needed to remain open minded about which solutions would win through. The ultimate test would be customer demand and which tools provided the most useful services.

SHIRINE KHOURY-HAQ said that Lloyd's covered 57 insurance companies, 90 syndicates, 350 brokers and 52,000 people. Last year it had met claims worth $25bn in 200 countries, gross of re-insurance. Whilst it needed to be very innovative in its products, for example in providing one third of the world's cyber risk coverage, not all insurers were at the leading edge of innovation. Accordingly, as COO of Lloyd's, she had had a major role in driving forward the digitisation of its markets. This had the objectives of improving customer experience and reducing costs although, as with the dot-com boom, there was always the danger of wasting money.

DLT had the potential to revolutionise Lloyd's processes, primarily in underwriting, claims management and back office functions. It could contribute by simplifying processes in customer identity checking and in reducing the potential for identity fraud. In underwriting it would reduce administration, the potential for human error and the risk of disputes. In the longer term it could provide immediate access to land records, business registration records and the meteorological history of properties. This should assist insurers with accurate pricing and reduce fraud, for example through systems for checking the provenance of goods. It should reduce delays in investigating and settling claims, with less scope for disagreement on relevant information.

It was important to be realistic about the challenges. DLT introduced some new risks as transactions were visible and lacked anonymity, and governance might be insufficient. The manner in which DLT was adopted could risk limiting market entry. Coding errors could undermine trust. If data were available to all, some privy controls might need to be incorporated.

Axa and Alliance were now investing in DLT. Lloyd's were assessing the feasibility of working with six partners on a business case for DLT in claims, with technology partners working alongside for free. In the future benefits would be as much improving customer service as increasing profit and reducing costs.

MIKE SHORT said that DLT would become a key enabler of FinTech. The UK had important leads in e-commerce, and should be seeking to export on the strength of this. Two years ago a report from the Government Office of Science had explored the potential of Blockchain. He wanted to draw out some of the potential of these technologies for the telecoms market, as there were important parallels to insurance. These included the scope for cost reductions, and more automatic identification of customers in dialling up. The transmission of money through mobile networks was already growing fast in Africa. The introduction of Blockchain into these applications could enhance security, and speed up credit checking. Payments could be made as well as money transfers. Further work was needed on the scope for record keeping, just as it was for the provenance of food, which had already been mentioned.

The mobile internet of things was already booming, with 7.5 billion devices connected on one measure, and potentially 25 billion once applications in cars and in meters were more widespread. There was lots of good experimentation; global standards would need to be forthcoming, as they had been in global telecoms.

Recent examples of DLT had shown its potential in the area of international development, such as in the use of iris eye reconciliation to identify Syrian refugees who possessed no physical papers. There were also examples for the world food programme in administering food assistance to refugees.

KEITH BEAR said he wanted to add three themes to the discussion. Trust was a core capability of DLT, in how it could deliver value through smart contracts which needed identity checking. It was perhaps taking a little longer for DLT to make an impact than had been anticipated, but consortia were making good progress in building co-operative networks in trade finance and in food provenance. One European network involving 9 banks providing trade finance for SMEs might start live transactions in a month. Adoption by regulators would be essential in some sectors. The Financial Conduct Authority had run excellent pilots, and he was involved in innovative work with the Guernsey financial regulator.

TIM SMITH said he had been involved in 22 DLT projects up to production, in the areas of settlements, derivatives processing, collateral management for derivatives and making collateral frictionless. He had shared the experience of other speakers that it could be hard to move away from historic systems. His experience had also been that apparently reasonable requirements from regulators in DLT projects could prove impossible to build. DLT could overcome processing inefficiency by keeping track of information straightforwardly and reducing fragmentation. It was useful for simplifying repetitive activities. The keys were consistency, code control and data control.

The subsequent discussion started with a debate about how national data protection legislation could effectively regulate new digital systems. In which jurisdiction did any data reside? In relation to financial systems, this would depend on where participants were domiciled, and on effective regulatory co-ordination, but solutions were starting to appear. DLT provided better ways of managing identity, and thus reduced the risk of theft. Related to data protection regulation, it was suggested that there could be a conflict between the new European General Data Protection Regulation (GDPR), with associated rights to be forgotten, and the basic principles of DLT, which identified participants. The way forward could depend on how ledgers were created, with the potential separation of personal data from other information. There were precedents for doing this in the mobile phone sector, which facilitate police access to data in a manner compliant with legislation.

There was then discussion about the links between DLT and Artificial Intelligence (AI), and the funding possibilities with AI being a Government Grand Challenge, and soon a Sector Deal as well. Linkages had started already in the telecoms sector. In some respects AI was well ahead of DLT currently, though there remained challenges with huge data sets.

One key system vulnerability of DLT related to cryptography, and the management of public and private keys. Any distributed network was as weak as its weakest network. In some sectors it could be a role for the regulator to be the trusted entity which managed keys. There had been incidents where bitcoin had been stolen, and then transactions unwound to restore the previous position.

New players should be expected in DLT, who could undermine the business positions of established players. It was not clear that such players had yet emerged, although some of the emerging consortia might become powerful. The time it would take to replace complete legacy systems in financial markets might protect established players for some time.

Although the UK had started strongly in DLT, some felt that European competitors were gaining ground, for example in FinTech in Berlin and in shipping in Rotterdam. Relevant standards were starting to be set elsewhere. A strong UK response involved running innovation labs here which attracted strong interest. The UK Government's commitment to a significantly rising R&D budget was helpful. A strong continuing position for the UK would require the right approach to data across European borders after Brexit.

How could public sector collaboration with the private sector promote the adoption of DLT? There were important opportunities in land registration, automatic number plate recognition and broadly in provenance. Best practice here was in Estonia. Exemplars had to be driven by securing benefits, and by promoting interoperability.

What killer applications could be expected from DLT? Potential applications included global supply chains, particularly in shipping through reductions in paper processing, in food provenance, in international payments and in land ownership.

Was there significant scope for DLT in the health sector, where public confidence needed to be very high in the security of patient records? Similar issues arose for criminal and immigration records.

If DLT ultimately led to use of a common ledger, would the consequence become that the ledger operated as a natural monopoly and the current role of private sector banks who operated different ledgers disappear? Most felt there would continue to be roles for financial institutions to continue to offer innovative

products, even if they had to spend less effort checking data. DLT would provide an impetus, especially in the financial sector, of examining how to retire historic cost bases. DLT would start to be deployed well before the breadth of its implications was understood. It might soon allow traditional financial auditing to be substantially simplified.

DLT would not solve the problem that some input data would continue to be invalid. There were no simple solutions to this.

In conclusion, it was felt that the practical deployment of DLT in large scale production networks might be only 18 months away. Continued experimentation would be vital. Progress would soon be needed in adopting suitable data and technical standards, to avoid the establishment of new silos. 10% of UK FinTech already focussed on Blockchain, and DLT would potentially have a transformative impact on financial services.

John Neilson

Useful reports and URLs - Click on a URL to go to that page

2016 report by the UK Government Chief Scientific Adviser
Distributed Ledger Technology: beyond block chain
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

House of Lords report - November 2017
Distributed Ledger Technologies for Public Good: leadership, collaboration and innovation
http://chrisholmes.co.uk/wp-content/uploads/2017/11/Distributed-Ledger-Technologies-for-Public-Good_leadership-collaboration-and-innovation.pdf

ISDA report - October 2017
ISDA Common Domain, Model Version 1.0 Design Definition Document
www.isda.org/a/gVKDE/CDM-FINAL.pdf

Gresham College Public Lecture - January 2018
Will Bitcoin and the Blockchain change the way we live and work?
Professor Martyn Thomas CBE
www.gresham.ac.uk/lectures-and-events/will-bitcoin-and-the-block-chain-change-the-way-we-live-and-work

GSMA Report
Refugees and Identity: Considerations for mobile-enabled registration and aid delivery
www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/08/TWP81_1_DigitialIdentityProgrammeReport_WebSingles_R.pdf

IBM Reports
Bridging the divide: How CLS and IBM moved to blockchain
www-935.ibm.com/services/us/gbs/thoughtleadership/bridgingdivide/

Unblocking the blockchain
www-935.ibm.com/services/us/gbs/thoughtleadership/unblocking/

Blockchain rewires financial markets
www-01.ibm.com/common/ssi/cgi-bin
ssialias?htmlfid=GBP03469USEN&

Thought leadership from the IBM Institute of Value
www-935.ibm.com/services/us/gbs/thoughtleadership/blockchainlibrary.html

UK Research and Innovation (UKRI)
www.ukri.org

Arts and Humanities Research Council
www.ahrc.ukri.org

Biotechnology and Biological Sciences Research Council
www.bbsrc.ukri.org

Engineering and Physical Sciences Research Council
www.epsrc.ukri.org

Economic and Social Research Council
www.esrc.ukri.org

Innovate UK
www.gov.uk/government/organisations/innovate-uk

Medical Research Council
www.mrc.ukri.org

Natural Environment Research Council
www.nerc.ukri.org

Research England
www.re.ukri.org

Science and Technology Facilities Council
www.stfc.ukri.org

Companies, Research Organisations and Academies:
Association of Innovation, Research and Technology Organisations (AIRTO)
www.airto.co.uk

British Academy
www.britac.ac.uk

Building Research Establishment
www.bre.co.uk

Catapult Programme
www.catapult.org.uk

Cranfield University
www.cranfield.ac.uk

Department for Business, Energy and Industrial Strategy
www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy

Government Office for Science
www.gov.uk/government/organisations/government-office-for-science

IBM
www.ibm.com/uk-en

Knowledge Transfer Network
www.ktn-uk.co.uk

Learned Society of Wales
www.learnedsociety.wales

Lloyd's of London
www.lloyds.com

Lloyd's Register Foundation
www.lrfoundation.org.uk

London Stock Exchange Group
www.lseg.com

National Physical Laboratory (NPL)
www.npl.co.uk

Nesta
www.nesta.org.uk
Royal Academy of Engineering
www.raeng.org.uk

The Royal Society
www.royalsociety.org

The Royal Society of Edinburgh
www.rse.org.uk

Russell Group
www.russellgroup.ac.uk

The Alan Turing Institute
www.turing.ac.uk

University Alliance
www.unialliance.ac.uk

Wellcome Trust
www.wellcome.ac.uk

Willis Towers Watson
www.willistowerswatson.com/en

Universities:
For a full list of UK universities go to:
www.universitiesuk.ac.uk