Shrewd Markets & Smart Settlement On Blockchains

Tuesday, 24 May 2016, London
♦ Activities – The Quiet Insurer, insurance and much more on blockchains

♦ The Pamphleteers Blog

♦ Long Finance Online Community - hear first about the latest news and events
   www.longfinance.net/online-community.html
09:00 – 09:15  “Potential Of Blockchain On The Securities Transaction Lifecycle”, Professor Michael Mainelli, Z/Yen Group Limited

09:15 – 09:45  “From Blockchain To A Global Marketplace For All Asset Classes & Instruments”, Richard Olsen, Lykke Corporation

09:45 – 10:15  “Institutional Payment & Settlement Infrastructure Based On Blockchain Technology”, Anthony Culligan, SETL

10:15 – 10:40  Discussion and Q&A

10:40 – 11:00  Close and networking
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<th>Measurement</th>
<th>Financial System</th>
<th>Monetary Systems</th>
<th>Regulation</th>
<th>Governance</th>
<th>Structure</th>
<th>Behaviour</th>
<th>Sustainability</th>
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<td>Confidence Accounting**</td>
<td>Insured Utility Banking*</td>
<td>Common Tenders*</td>
<td>Mortgages*</td>
<td>Ethics</td>
<td>Pensions Indemnity Assurance</td>
<td>Concepts of &quot;Fairmos&quot;</td>
<td>London Accord 2007**</td>
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<td>Futures of Finance</td>
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<td>Ethical Banking*</td>
<td>Internal Growth Rate Measures for Pensions**</td>
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<td>(24 integrated reports) &amp; London Accord*</td>
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<td>Clustering*</td>
<td>Cryptocurrencies (aka Alt Coins) and Blockchains*</td>
<td>Compliance Architectures</td>
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<td>Cyber Reinsurance*</td>
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<td>Bum it all?!</td>
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<td>Asset Management*</td>
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<td>Policy Performance Bonds (Index-Linked Carbon Bonds &amp; Index-Linked Forestry Bonds)*</td>
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<td>Emerging Markets*</td>
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<td>Sell-Side Research</td>
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(*) indicates research at an active stage  (**) indicates research at an advanced stage
“The Impact And Potential Of Blockchain On The Securities Transaction Lifecycle”

SWIFT INSTITUTE

SWIFT INSTITUTE WORKING PAPER NO. 2015-007

THE IMPACT AND POTENTIAL OF BLOCKCHAIN ON THE SECURITIES TRANSACTION LIFECYCLE

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ALISTAIR MILNE

PUBLICATION DATE: 09 MAY 2016

The views and opinions expressed in this paper are those of the authors. SWIFT and the SWIFT Institute have not made any editorial review of this paper; therefore the views and opinions do not necessarily reflect those of either SWIFT or the SWIFT Institute.
High Costs In Global Securities Markets?

♦ Only estimates, e.g. from Oliver Wyman
  ➢ one figure $17bn-$24bn per annum globally just on post trade processing of securities trades
  ➢ higher estimates of $40bn-$45bn when including collateral management, custodian services
  ➢ circa $100bn per year, adding also various reporting, risk-management and regulatory functions
  ➢ just securities, also currencies, commodities and derivatives

♦ Little information on breakdown of costs
  ➢ e.g. how much is reconciliation that could be solved by bilateral data sharing, not MDL?
Myths Of Real-time Settlement

♦ Some prominent supporters of MDL or ‘blockchain in securities settlement’ claim this is about making settlement real time. They are confused:
  ➢ delayed settlement (T+2) is a design choice reflecting deeply embedded practices, e.g. access to leverage and liquidity.
  ➢ shifts to real-time settlement economise on the commitment of cash and collateral, but this benefit is not large, e.g. interest rate benefits of tying up cash or collateral overnight or for two days are minor.

♦ Real-time settlement is perfectly achievable without MDL - more important benefit from applying MDL in securities settlement is from greater certainty of final settlement time
### MDLs Are Database Technologies

<table>
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<tr>
<th></th>
<th>Centralised Databases</th>
<th>Distributed Databases</th>
<th>Mutual distributed ledgers (unpermissioned)</th>
<th>Mutual distributed ledgers (permissioned)</th>
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<tbody>
<tr>
<td><strong>Storage</strong></td>
<td>Single master</td>
<td></td>
<td>Multiple copies</td>
<td></td>
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<tr>
<td><strong>Definition of data</strong></td>
<td></td>
<td></td>
<td>Multidimensional, typically using some approximation to the relational database design of Codd</td>
<td>Specialised single dimensional for e.g. ownership, amount</td>
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<tr>
<td><strong>Participation</strong></td>
<td>Closed</td>
<td></td>
<td>Open. New nodes can be freely added.</td>
<td>New nodes added subject to agreement by core participants.</td>
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<tr>
<td><strong>Rights e.g. for updating of entries</strong></td>
<td>Governed by separate database management system</td>
<td>Built into the ledger protocol.</td>
<td>Configuration file determines all node rights to decrypt/update</td>
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<tr>
<td><strong>Validation of data</strong></td>
<td></td>
<td></td>
<td>Uses ‘proof of work’ or some weighted voting schema such as ‘proof of stake’</td>
<td>Typically based on confirmation by core participants</td>
</tr>
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<td><strong>Reconciliation of data</strong></td>
<td>Only necessary when data is moved.</td>
<td>Iterative, trading off consistency against availability</td>
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<td><strong>Robustness</strong></td>
<td>Historically vulnerable to server failure</td>
<td></td>
<td>Resilient, continues to update even with partial node availability</td>
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Vision 1: Disruptive Technological Transformation

- Has occurred in many industries
  - media, both news and audiovisual
  - travel and hotel reservations
  - telecommunications
  - retail supply chain …

- FinTech: is finance facing an ‘Uber moment’?

- Cryptocurrency adherents - finance without financial intermediaries
Vision 2: Adaption Of Current Processes

♦ Institutional landscape remains broadly the same as today (the six Cs)
  ➢ custodians, central securities depositories, central banks, central counterparties, correspondent banks, commercial banks

♦ Continuing evolution toward automated and standardised processes
  ➢ payments and securities processing
  ➢ ‘business as usual’ not a transformation
What’s Old? What’s New?

♦ Mutual distributed ledgers are *not* new
  - just another database technology
  - cryptography makes it easier to manage access and control
  - but industry will require integration with existing databases

♦ What is new is the broader strategic challenge posed by applying information technology in financial services
  - complete rethinking – over the next five to ten years? – of industry infrastructure and data
  - shifting from limited participation with relatively high margins to more competitive and low margin
  - an integrated view of transactions and business processes and supporting data on ownership, collateral, and risk

♦ Desired outcome *is* transformation
  - by improving efficiency of intermediation – from global financial markets to microfinance – should benefit almost everyone
  - intermediaries will still have plenty of profit opportunities
Technology Challenges
Mutual Distributed Ledgers (aka blockchains)

- No Trusted Third Parties
- Single Trusted Third Party
- Efficient
- Inefficient
- Central Database
- Master Node
- Majority Nodes
- ‘Woven’ Broadcasting
- Supervisor Nodes
- Free for All Nodes
- Collective Nodes
- Bitcoin
- Ethereum
- Ripple
- Paper
MDL reduces role of trusted third parties (central authorities)

- safeguarding
- preserving the history of transactions

Not Bitcoin ‘maximalism’, central third parties needed for:

- confirming existence of the asset (security, money or other asset) to be traded and community membership (identity)
- compliance with law and regulations
- guaranteeing rights of those participating in the transaction

Further institutional arrangements needed for governance, permissioning, identification, dispute resolution
Conclusions

♦ Ambitious claims for mutual distributed ledgers and lots of initiatives working on ‘proof of concepts’

♦ Few easy wins:
  ➢ MDLs and associated standardisation of data lowers switching costs and potential for exploiting market power
  ➢ So there will be resistance from incumbents

♦ Honouring the full promise of mutual distributed ledgers (and other FinTech) will not come automatically, easily, or cheaply
Presentation

“From Blockchain To A Global Marketplace For All Asset Classes & Instruments”

Richard Olsen, Lykke Corporation
“Institutional Payment & Settlement Infrastructure Based On Blockchain Technology”

Anthony Culligan, SETL
Discussion and Q&A
Closing Remarks

Professor Michael Mainelli

Executive Chairman, Z/Yen Group
Principal Advisor, Long Finance
‘When would we know our financial system is working?’

Objectives:
- Expand Frontiers
- Change Systems
- Deliver Services
- Build Communities
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