

The Financial Technologist

Q3 •• 2016


HARRINGTON STARR
Your Success. Our Business



Brexit

WHY
FINTECH'S
FUTURE IS
STILL BRIGHT

Plus

THE
CHANGING
FACE OF
FINANCE

The sector's
most dynamic
names have
their say

AND

Why your master data
management needs data





Unchaining public services - will mutual distributed ledgers (aka blockchains) power a public sector revolution?

SIMON MILLS &
PROFESSOR MICHAEL MAINELLI,
Z/YEN GROUP

**"You are fettered," said
Scrooge, trembling.
"Tell me why?"**

**"I wear the chain I
forged in life," replied
the Ghost. "I made it
link by link, and yard by
yard; I girded it on of my
own free will, and of my
own free will I wore it."**



Mutual distributed ledger (MDLs, aka blockchain) technology has only recently become popular, and may need a bit of definition for most readers, starting with some basics:

- **ledger** - sequential record of transactions;
- **distributed** - divided among several or many locations;
- **mutual** - shared in common, or owned by a community.

In combination then, a mutual distributed ledger (MDL) is an immutable, tamper-proof, record of transactions shared in common and stored in multiple locations. Since January 2009, Bitcoin and other cryptocurrencies have drawn attention to their successful technical use of MDLs. Their MDLs have been coined 'blockchains'. Though cryptocurrencies have garnered some notoriety, in January 2016, the UK Office of the Government Scientist emphasised the importance of the ledger technology they employ to the public sector in "Distributed Ledger Technology: Beyond Block Chain", opening with "we may be witnessing one of those potential explosions of creative potential that catalyse exceptional levels of innovation".

A blockchain is just one form of MDL but, as Bitcoin has a hold on popular imagination, the terms blockchain and MDL are often interchangeable. So why are MDLs suddenly such a big deal? MDLs have the potential to replace any process which requires the use of a database by multiple parties. MDLs have a number of advantages over data bases as, unlike databases, they are

- **permanent** - once entered into the ledger, records cannot be altered;
- **persistent** - their distributed, unalterable

nature means that the loss of a complete database is almost impossible;

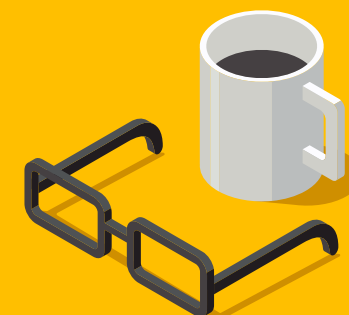
- **pervasive** - everyone has access and they can reach deep into replacing much inter-organisational messaging.

It's a bit like everyone having a logically central database that is physically distributed. MDLs are not new. Such a simple technology has important implication, but has been slow to be adopted. Our firm, Z/Yen pioneered an early form of MDL back in the mid 90's. For two decades the knee-jerk response has been that MDLs must be complex and insecure because they run on multiple machines. Their endurance in the harsh environment of cryptocurrencies has shown their strength, though cryptocurrencies have other problematic technical issues such as their 'mining' algorithms that, while mathematically intriguing, court controversy and consume much energy.

Technically MDLs are just data structures. They are more complex than simple databases because they work across multiple machines. If an application is within a single firm, an MDL is unlikely to displace a traditional central database. Their power comes from allowing multiple organisations to work together smoothly and share trust and power. To date, there have been four themes:

Transactions - banking has been abuzz with chatter about MDLs, perhaps overhyping their potential to replace payments. Meanwhile, some quieter areas of financial services, such as insurance and back-office processing, already use MDLs to do such things as confirm multi-party obligations or provide insurance for the sharing economy.

Records - MDLs are ideally suited for timestamping or datalogging. They can be used to lay down long-term records, such as land registry information. They can be used for geostamping, for regulatory reporting, and for archiving. Universities have been exploring their use for scientific and academic archives for some time. The States of Alderney launched a free timestamping service, MetroGnomo, which is being



used to log a variety of data, not just financial records but also operational records, such as over 50,000 clinical psychology trials each day for a US regulatory submission and a UK university.

Identity – the ability to store data cryptographically has unleashed a number of approaches to certified documentation meeting data protection principles such as the ‘right to be forgotten’ and the ‘citizen is the data owner’. Since 2007 Estonia has successfully pioneered a universal, national identity scheme using MDLs. Firms such as PwC have demonstrated MDLs that can help exchange anti-money-laundering applications, health records, and educational records. Similar systems can provide business ‘passports’, an easily shared certified registry of government information about a company.

Internet-of-Things – perhaps the most significant announcement of 2015 was from IBM and Samsung. They announced their intention to work together on ADEPT (Autonomous Decentralized Peer-to-Peer Telemetry), a MDL for distributed networks of devices. With billions of people on the planet, we may need several tens of billions or even low trillions of ledgers recording all these transactions in case of dispute. My freezer-electricity-control-ledger, my entertainment system, home security system, heating-and-cooling systems, telephone, autonomous automobile, local area network, telephone recording, etc.

There are a number of significant practical, legal and cultural challenges. In financial services, regulators are mulling over how they should respond to the uptake of MDLs in order to mitigate potential risks to clients, organisations and the reputation of financial systems. Are current regulations and standards sufficient, or should new ones be developed? If so, how can standards help manage risk without stifling innovation?

A wide range of public sector work could benefit from the adoption of MDL technology. The government is the source ‘ledger’ already for an enormous amount of information, including:

- **Public records** – land and property titles, vehicle registries, business licenses, company information, regulatory records, criminal records, birth/death certificates, voting ID, building and other permits, court records, government/listed

companies/civil society, accounts and annual reports.

- **Semi-public records** – educational records, university degrees and professional qualifications, licences, medical records, criminal records, scientific data, inspection reports, tax returns.

- **Private records** – passports, digital signatures, wills, bio-metric data.

- **Intellectual property** – copyrights, licenses, patents, trademarks, proof of authenticity or authorship.

- **National records** – cultural and historical art, video, photos, audio, weather, temperatures, traffic.

Land registry may be one of the most basic areas to watch. Last year it was widely reported that Honduras, one of the poorest countries in the Americas, had decided to build a blockchain MDL to power its land registry in order to eliminate corruption and establish secure mortgages, contracts, and mineral rights for the 60% of the population without registered land titles. Unfortunately, since the initial excitement around the launch, it appears that the project has stalled because of “political issues”. In April it was revealed that the Republic of Georgia has signed a deal with Bitcoin mining company BitFury to develop a system for registering land titles using the blockchain. Sweden and other northern European countries have confirmed that they are examining MDLs for land registry.

MDLs hold great promise, but three things will slow public sector adoption in the near-term. First, MDLs are more complex than simple databases. There is also confusion with cryptocurrencies, anathema for sovereign Governments. Second, resources have been poured into legacy ICT systems over decades, and innovation in public sector ICT has a bad track record. Rightly, concerns around governance, compliance, liability, and security and weigh on public sector managers’ minds. Third, policy makers realise that the development of national, interconnected MDLs holding large amounts of personal data, raises significant questions about the relationship between citizens and the state. In the private sector, one of the attractions of MDLs is that they decrease the power of natural monopolies by removing sole ownership of data. Arguably, MDLs could be a wonderful source of ‘open data’. However, reducing public sector reluctance to cede control of public data has been a long-running struggle.

MDLs are definitely the long-term future for public service information. However, in the UK it will take more than just one report before the public sector casts off its central database shackles and embraces a blockchained future.



HARRINGTON STARR

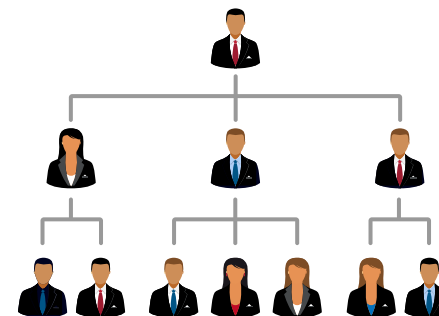
HELPING THE WORLD'S MOST EXCITING COMPANIES IN FINANCIAL TECHNOLOGY GROW WORLD CLASS SALES TEAMS

Your Success. Our Business



GROWING TEAMS

Working exclusively with the sector's most dynamic sales talent



GROWING BRANDS

Leveraging your brand through our publications and publicity



GROWING NETWORKS

Connecting and creating business opportunities through events, introductions and connections



Over 600 of the leading software vendors, consultancies, fintech startups, banks, hedge funds, brokerages and exchanges trust Harrington Starr to grow their business. Join the community

www.harringtonstarr.com