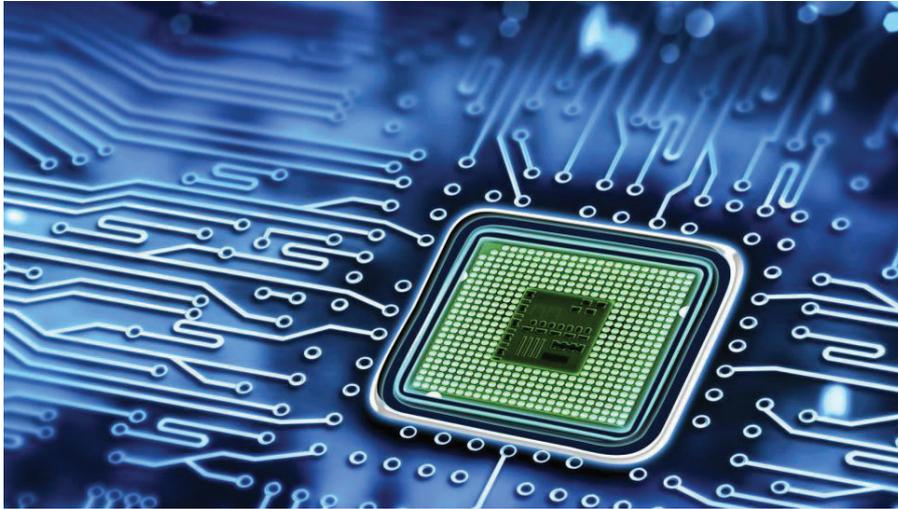


Gold and the Blockchain

By Charlie Morris, Editor of Atlas Pulse and CEO of CCData.CC



Bitcoin, the digital or 'crypto' currency launched in 2009, was designed to mimic gold in the digital age. There are deliberate similarities between them, such as scarcity, and the term used to describe the creation of new bitcoins is 'mining'. Whilst the bitcoin network is still growing, the turbulence has been extreme and its future relevance remains uncertain – at least as a store of value.

Gold has seen off this computerised impersonator for the time being, and whilst that is unlikely to change anytime soon, the gold market has much to learn from the software that drives bitcoin, known as the blockchain.

Gold is bulky and LBMA members agree that it is best left in the vaults in a provenance network. For many years, this social technology has allowed the wholesale gold market to thrive. Dealers on opposite sides of the planet can be sure that their gold is genuine, despite never having seen it. Until 2003, the retail market was left behind and investors were limited to buying coins with dealing spreads of over 5%. There was no cost-effective way for the general public to invest in gold.

Then the exchange-traded fund (ETF) was launched, which allowed smaller transactions to become viable, thus opening up the market to a much wider audience. For the first time, gold could be traded as if it were a share. With online dealing commissions of \$10 or less, the efficient transaction size fell below \$1,000 for the first time.

Whilst bitcoin has failed to surpass gold as the backstop of the financial system, the blockchain shows great potential. This technology enables transactions to be highly secure, whilst dealing costs virtually disappear. By settling gold transactions over a blockchain, the efficient transaction size could fall to less than a dollar, with dealing costs just a fraction of a cent. For the first time in history, gold could be swapped for a cup of coffee.

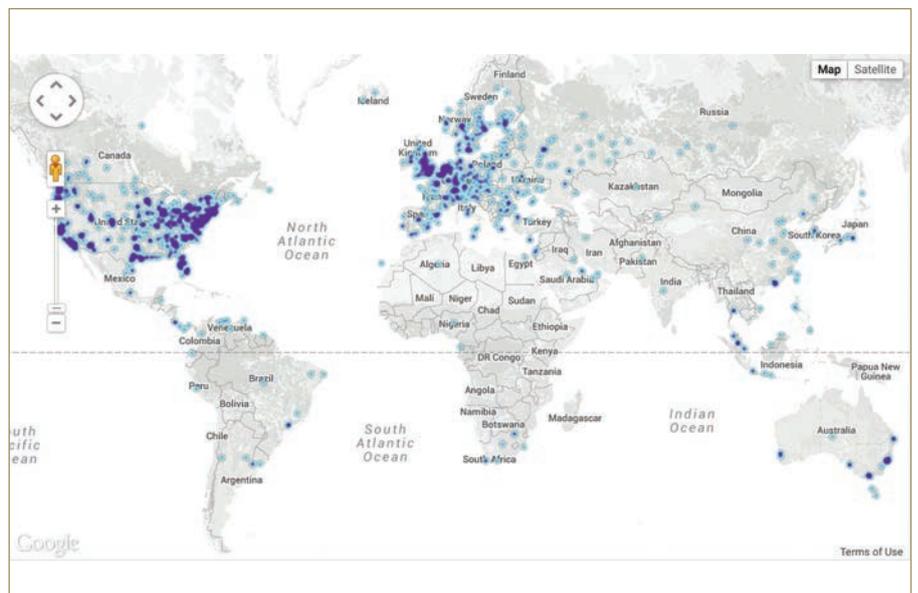
Gold on the blockchain

There are a few technical terms that are worth understanding. A public blockchain is a decentralised database that is open to all. For bitcoin, there are more than 6,000 identical copies (nodes) running around the world simultaneously in 84 different countries. To switch the network off, every single copy would have to be destroyed. That's not an easy task.

When a bitcoin transaction takes place, it is recorded and verified by the 'miners'. These miners use vast amounts of computing power to operate the network. The more power they use, the more secure the network becomes. All transactions and ownership records are published on the blockchain and can't be deleted. The miners ensure that each transaction is valid (you can't cut and paste a bitcoin) and, for their efforts, are rewarded with new bitcoins and some transaction fees.



Chart 1 shows the average number of bitcoin transactions each day. The network continues to grow, but the rate has slowed as its role as a currency has, so far, failed to deliver.



Location of bitcoin nodes. Bitcoin nodes are copies of the database. There are more than 6,000 copies around the world. To shut the network down, every single copy would have to be exterminated. That's no easy task.

Anyone with a super-computer can become a miner, and it is a highly competitive process since the miners are competing for value. Remarkably, the network functions with tens of thousands of actors but without any management or supervision whatsoever – perhaps that scares parts of the establishment.

Swapping bitcoin for gold

Several bullion dealers have integrated bitcoin onto their platforms. Companies such as Bitgild, Vaultoro and Bitgold accept payment for gold in bitcoin. Vaultoro excepted, these companies are online gold platforms that accept payment in bitcoin in addition to fiat currencies. Vaultoro, on the other hand, only accepts bitcoin.

“ I tested Bitgold to see how it worked. I sent 0.1 bitcoin (\$25) and the transaction was picked up by its system immediately, and I became the proud owner of 0.614 g of gold that was stored in Dubai. The whole process took three minutes, which included opening the account. ”

For most of these platforms, the bulk of the business continues to be done in fiat currencies, and bitcoin has had only a modest impact on sales. To their credit, they have been hugely successful in reducing the dealing costs for small transactions. To their detriment, they are ‘centralised’ business models as the gold is non-transferrable to third parties once you have purchased it. It is simply your gold, held in their custody.

Buying gold with bitcoin

I tested Bitgold to see how it worked. I sent 0.1 bitcoin (\$25) and the transaction was picked up by its system immediately, and I became the proud owner of 0.614 g of gold that was stored in Dubai. The whole process took three minutes, which included opening the account. Not only is that quick, but cheap. I paid just 0.5% above the spot price, which is very competitive, especially given the small size of the trade. Bitgold, like the other platforms, works extremely well.

Bullion Bitcoin

Before any of these gold-for-bitcoin businesses came to fruition, Adam Cleary, an ex-hedge fund manager, founded Bullion Bitcoin. It was 2013 and bitcoin was just beginning to capture the public’s imagination. He was ahead of his

time and created an electronic token, known as Bits of Bullion (BoB), that was backed by physical gold. He wanted to allow the world to own gold electronically and be able to transfer it thereafter in a ‘decentralised’ manner.



Adam Cleary, CEO of Bullion Bitcoin – an early adopter of blockchain technology for the gold market.

In this system, the BoB were held in a customised bitcoin wallet, known as a SparkBit, which allowed the gold to be transferred to other wallet holders. The proof of ownership, whilst anonymous, was permanently recorded and could be tracked using bitcoin’s blockchain.

I tested the system in late 2014. Once again, I invested 0.1 bitcoin into BoB that immediately showed up in my SparkBit wallet. I was in direct control of my gold and the proof that I owned it was a matter of public record on the blockchain. Above all, I could send my gold anywhere I liked and this is what it means to be decentralised.

The system was a good idea, just too complex to take over the world. Despite being the first to directly create an electronic token linking bitcoin to gold, Cleary’s vision was ahead of its time. The user complexity meant that BoB failed to gain traction in the market.

Cleary hasn’t given up and believes that the concept would succeed if it were a standardised and collaborative effort by the gold industry. The system would need to be run on a not-for-profit basis and embrace the best features that blockchain technology has to offer – the key objective being that gold would be digitally and freely transferable.

Autilla

There are even more ambitious plans afoot for the wholesale market. The seasoned commodity broker, Mike Greenacre, is the CEO of Autilla. Having already built an exchange for the OTC wholesale gold market, he’s developing plans to build a membership-based ‘distributed ledger’ using a new version of bitcoin known as G-Bit.

In order to do this, the bitcoin code will be adapted to create a new digital ‘currency’ that would be entirely separate from bitcoin. It would have different design features to meet the specific requirements. Like Cleary’s BoB, the G-Bit is expected to have zero value and just act as a secure reference that represents the ownership of gold. The system would be underwritten by ‘digitised’ physical gold held in a network of vaults.

Unlike crypto currencies, where the blockchains are open for all to see, access to the G-Bit blockchain (accessed via a node) would be restricted to market participants such as refiners, custodians and dealers. The G-Bit blockchain would therefore remain private, but open to all verified users – professional or retail. Autilla will initially focus on the professional end of the market, but will allow partners to embrace retail customers thereafter.

Investors would also be able to trade gold over Autilla’s exchange, which provides real-time matching, netting and settlement for the wholesale market. The gold would then be held in a bar provenance network, enabling future transactions to be fast, reliable and secure.

Greenacre describes the process as ‘cryptographically generated smart contracts’. He feels that the digital network should be restricted to market participants for security and compliance reasons. The brokers would create and redeem G-Bits in a similar way to how the ETF-authorized participants issue shares. The G-Bits would then be freely transferable within the network. If this plan came to fruition, it would be a giant leap forward for the gold market.

The Real Asset Co

UK fintech is an exciting space and its home is on Level 39 of One Canada Square, Canary Wharf. There are numerous young companies aiming to shake up the world of finance. One such resident is The Real Asset Co, an online gold and silver platform founded in 2010. It has 3,500 registered users and wants to grow its business using blockchain technology and a token called Goldbloc.

The Real Asset Co’s plan is similar to Autilla’s G-Bit, except that it is aimed at the retail market. Both companies want to use private blockchains, so that they control the network and create digital tokens that effectively become electronic bearer certificates.

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The CEO, Jan Skoyles, has been to 10 Downing Street to advise the British government on blockchains and has represented the UK on trade missions. The response has been positive, and Chancellor George Osborne is fully behind the fintech movement and wants

Britain to take the lead. It is quite clear that Britain has talent, but one of the structural challenges has been regulation.



Jan Skoyles, CEO of The Real Asset Co. If you can't find her on Level 39, that's because she's probably at Number 10.

Regulation

Presumably, the regulators would be relatively comfortable with businesses that operate within a closed loop since they would have a clear audit trail. However, it would be unsurprising if they were somewhat hesitant about retail investors 'emailing' gold around in cyberspace.

The UK's FCA has approached this subject in a positive manner and has created 'Project Innovate' to assist fintech start-ups with regulatory matters. Its brief is to encourage innovation and promote competition within financial services. In order to do this, it must listen to the industry, understand the issues and provide guidelines – it seems to be working.

However, if a business wants its digital gold tokens to be freely transferrable, the regulators might view that as money transfer, which would require a banking licence. That would be onerous, but there may be a technological solution to the problem. Blockchains already track transactions between wallets, it's just that we don't know whose wallet it is. If they could be verifiably identified, perhaps digital cybergold would get the green light.

A digital gold market

The vision is to create digital gold transactions. The result would reduce costs and make gold more accessible to all. The 2.5 billion unbanked people who live in developing countries could consider storing their gold on their phone. The rich could swagger around town with a fortune in their pocket. The Internet would have a borderless means of value transfer with no central counterparty. Finally, we would be able to buy a cup of coffee and pay with gold. That's not a ridiculous idea and, no doubt, many people would embrace this as a means of living through a banking crisis – just ask the Greeks. All of these applications, and more, would be enabled by gold-on-the-blockchain. Like the arrival of the ETF, digital gold would lead to additional demand.

Losing your phone would not necessarily mean losing your gold as security settings are changeable. Naturally, the gold isn't inside your phone. All you need to recover

ownership is a copy of your security keys. Using smart contracts, you could opt for two or more trusted parties to authorise a transfer, meaning that you would just lose your phone and not your gold. You could even separate your holdings into savings that are locked down with high security, whilst the more modest holdings of 'readies' could be spent rather like cash in your wallet – for that cup of coffee.

Improving the data

A further added benefit of transacting over the blockchain is the resulting data. Currently, the market keenly awaits the GFMS quarterly release, which gives us a sense of geographic and sector demand trends. The blockchain, whilst keeping individual investors' details confidential, would be able to generate econometrics in real time. Analysts and journalists may even stop guessing why the gold price just moved.

Better data and transparency will benefit the gold market. The more we collectively know, the more faith we have. Gold ownership is much more likely to grow if there are fewer privileged participants.

Dragging the world's ancient and timeless asset into the digital age won't happen overnight, but this is non-negotiable if gold is to fulfil its potential in the 21st century. The objectives are to reduce transaction costs, create a provenance network for both wholesale and retail, and embrace digital technology.

This ambitious plan is more likely to work with firms in collaboration than in competition. A single platform would lead to a deeper market where transactions could be hundreds of tonnes or just a fraction of a gram. This combination of cutting-edge technology, combined with the timeless store of value, will herald a new chapter within economic history.



Charlie Morris is the editor of *Atlas Pulse*, a newsletter focusing on gold, disruptive technology and blockchains.

He is also the CEO and founder of CCData.CC, a start-up that will provide econometrics for blockchain applications.

Prior to April 2015, he spent 17 years at HSBC Global Asset Management as the Head of Absolute Return, managing a multi-asset fund range. He is a familiar face in the financial media, with more than 200 appearances on CNBC. In 2012, he addressed the London Bullion Metals Association at its annual conference in Hong Kong about the three criteria to determine a gold bull market. In late 2012, that model signalled a bear market – something that still stands.

Prior to a career in fund management, Charlie was an officer in the Grenadier Guards. He recently completed the Camino de Santiago, a 500-mile walk across Spain.

The Legend of King Richard "the Lionheart" and the origins of the Austrian Mint (continued from the front page)

The song on the front cover is the song with which, as legend has it, the faithful minstrel Blondel found his imprisoned master King Richard "the Lionheart" in 1192. Through music, he unwittingly played a hand in the foundation of the Austrian Mint. Having made a truce with Saladin at the end of the Third Crusade, King Richard I "the Lionheart" headed home to England from the Holy Land by sea. When bad weather forced him to travel overland from Italy, he was later captured near Vienna by Duke Leopold VI of Austria, whom Richard had previously insulted by dragging the Austrian standard through the dirt after the siege of Acre, and haughtily rejecting the Duke's demands for a share of the booty.

When the Duke heard that Richard had been seen on Austrian lands, he ordered his capture. In Vienna Richard drew attention to himself by settling his bill at a local tavern with large quantities of Levantine money, and was promptly arrested and imprisoned in the castle of Dürnstein on the banks of the Danube.

The legend goes that Richard's loyal minstrel Blondel searched for his master from castle to castle by singing a song known only to him and the King. After a year of imprisonment in Dürnstein, Blondel eventually located Richard when the King was heard singing the song back to his minstrel. His release was secured in 1194, though not until Duke Leopold had been paid a ransom of some 15 tons of silver. The Duke used his part of the ransom to modernise the fortifications of Vienna, Enns and Hainburg, and found the city of Wiener Neustadt. It also funded the creation of the Vienna Mint in 1194, where the remaining silver was struck into coins. The tale of Blondel and Richard "the Lionheart" is one of Europe's most abiding legends, but the rest, as they say, is history.