Online currencies look to reshape the way we buy and sell...
A SHORT TIME AGO, the idea of a decentralised virtual currency based on cryptography technology and operating over a worldwide peer-to-peer network would have been considered science fiction. However, it is now a daily reality for users of bitcoin and other virtual currencies.

Bitcoin was introduced to the world in a 2008 paper released by an unknown individual, or group, using the name Satoshi Nakamoto. The paper detailed a decentralised virtual currency that anyone could use, with a transparent ledger and transactions, not based on trust but secured mathematically by cryptography. Satoshi, whose identity remains a mystery, is widely believed to hold one million units of this currency (known as bitcoin).

In creating bitcoin, Satoshi’s intention was to devise an efficient, trustless, electronic payment system. Given the willingness of payment processors to perform chargebacks, merchant fees (driven by consumer fraud) make small transactions impractical and require merchants to exercise caution when dealing with customers. Bitcoin entirely bypasses the traditional system: transactions are sent person-to-person like digital cash, and their irreversibility eliminates the possibility of fraud from chargebacks. This allows merchants to confidently accept payments from customers and keeps fees low.

Bitcoins can be transferred anywhere almost instantly, generally have lower fees than bank transfers and other money transfer services, and provide high levels of anonymity for senders and receivers. Bitcoins are exchanged for traditional currencies on many exchange markets, through various brokers, and even via ATMs. New bitcoins are created at a diminishing rate to limit the total number to 21 million. This has led many to view bitcoin as a deflationary currency with a value that is likely to rise over time, and therefore to treat it as a speculative investment.

Unlike earlier centralised attempts at virtual currency such as E-gold and Liberty Reserve, which were shut down following US government prosecution relating to the illegal operation of money transmittal services, the bitcoin network is decentralised, so is resilient in the face of such takedown attempts by governments and regulatory agencies. The network is made up of thousands of individual volunteers and organisations running software that propagates transactions to all peers in the network, with each keeping their own complete record of historical bitcoin transactions—known as the ‘blockchain’. As a result, the bitcoin network has no central point of failure.

Bitcoin addresses, which function as accounts, are not linked to real world identities. Instead, they appear as a seemingly random string of characters (e.g.: 1Zc6D5iU4Rq3P4ZxKzrL5Lm- MBztrjX) which represent a user’s cryptographic public key. A user can transfer bitcoins from their address by using the corresponding private key to prove ownership. These public/private keys are generated by bitcoin wallet software and new addresses can be readily created.

Newly-generated bitcoins are awarded to people known as ‘miners’ who contribute computing power to the bitcoin network. Miners process transactions by performing mathematical calculations to confirm batches of bitcoins in ‘blocks’ appended to the blockchain. The difficulty of such calculations adjusts to maintain an average block creation rate of 10 minutes and the reward for creating the blocks halves every 210,000 blocks (about 4 years) to limit total production to 21 million bitcoins. Recently bitcoin mining has become more centralised with the manufacture of dedicated bitcoin-mining devices.

APPLICATIONS

THE MOST visible use for bitcoins has been in commerce—predominantly, e-commerce. Merchants accepting bitcoins typically use a third-party payment processing service such as BitPay or Coinbase that can automatically convert received bitcoin payments to traditional currency over an exchange, eliminating the exposure of retailers to the currency’s volatility and protecting against exchange losses.

For merchants, there are many advantages in accepting bitcoin payments through bitcoin payment processors and as standard bitcoin transactions. The irreversibility of such payments, which eliminates chargebacks and fraud, enables global online merchants to expand their customer base by safely accepting payments from high-risk countries such as Russia, Indonesia, and Malaysia. Merchants and consumers in these regions, who have been neglected by traditional payment processors, similarly benefit by gaining access to the global economy through an alternative international payment network. Accepting bitcoin transactions also generally incurs lower merchant fees than credit cards and other payment processors such as PayPal, and start-up costs for small retailers are low—a device capable of accessing the internet is usually all that is required. The downside is that the relatively low use of the currency creates a barrier for large retailers who face significant implementation and staff training costs. Many are not able to justify such an investment, given bitcoin’s uncertain future.

From a consumer perspective, payment by bitcoin is not a particularly attractive option. Holding such a volatile currency with the intention of spending it is a gamble and not practical for most people. With initial exchange and transfer fees factored in, payments in bitcoin may end up costing more than traditional payment methods. Furthermore, bitcoin transactions do not offer protection against potentially fraudulent merchants and contactless payment technology may be more convenient for in-person payments.

Bitcoin has also been tarnished by its role in black- and grey-market transactions, and the anonymity it offers users has been well utilised by criminals. Silk Road was a marketplace website accessible through the Tor anonymising network.
that connected buyers and sellers of illegal goods, primarily drugs—much like a black-market version of Amazon. Carnegie Mellon University researcher Nicolas Christin monitored customer feedback on Silk Road for an eight-month period in 2012 and found that daily sales from all vendors averaged about 20 per cent of the daily trades on the largest USD/BTC exchange market at the time. Silk Road was shut-down in October 2013 by the US Federal Bureau of Investigation, which seized almost 175,000 bitcoins with a current value of about US$100 million from the site and its alleged owner, Ross Ulbricht. Despite the closure of Silk Road, numerous other drug markets have continued to grow and recent reports indicate that together they have surpassed the original Silk Road in the number of unique listings and total sales.

Other illegitimate uses of bitcoin include for online gambling in areas where gambling is illegal or highly regulated, as payment extorted by ransomware computer viruses, and for money laundering and tax evasion.

Perhaps the most popular use of bitcoin, however, is for speculative investment. With its artificially manipulated scarcity and declining rate of supply, many investors are betting on the future of bitcoin, believing that its value will continue to rise. Within New Zealand very few local merchants currently accept bitcoin payments, and it is probable that most local bitcoin exchange is for speculative investment and trading.

Our research has found bitcoin exchange growth in New Zealand, and its adoption by users, to be consistent with that reported elsewhere. Downloads of bitcoin wallet software and exchange volumes on NZD/BTC markets suggest that bitcoin is thriving in New Zealand as it is in the rest of the westernised world.

Although comparatively still small—the largest volume of NZD/bitcoin exchange was just $2.8 million in Q4 2013—bitcoin/NZD exchange markets have displayed exponential growth, most notably in Q2 and Q4 2013, which coincided with sharp rises in the market value of bitcoin and increased media coverage of the currency. With bitcoin still far from a critical mass level of adoption, explosive growth is still possible in the future. It is worth noting, however, that due to a lack of liquidity on NZD markets, institutional investors and others trading large amounts of bitcoin will likely do so on USD/bitcoin markets.

A Guide to Virtual Currencies

AMAZON COINS
Online retailer Amazon is one of a small number of technology companies that have created virtual currencies—largely limited to use on their own websites. Amazon coins was released in May 2013 as an easy way for customers to purchase apps, games, and in-app items on the company’s app store and website. Amazon coins—which can be purchased in bulk at a small discount but cannot be converted back into dollars—are seen by some principally as a strategy for reducing merchant fees on credit card purchases.

FREICOIN
Based on the bitcoin protocol, the peer-to-peer system allows for the creation of up to 100 million freicoins, some 20 per cent of which have been mined so far. Unlike bitcoin, freicoin imposes a demurrage fee in an attempt to improve the currency’s long-term stability. At present, the currency’s use is largely restricted to niche online merchants.

LITECOIN
Also based on the bitcoin protocol, litecoin transactions can be confirmed with less delay. So far about a fifth of the total of 84 million litecoins have been mined. The combined value of those in circulation is estimated at $60 million. As with freicoin, the currency is almost entirely limited to online merchants.

RIPPLE
Developed by a Silicon Valley company, OpenCoin, ripple is both a currency and a payments system capable of recording transactions in real-world assets such as dollars and gold. OpenCoin (now called Ripple Labs) intends distributing some 50 billion units of the virtual currency over the next few years to boost usage. The system is designed to eliminate the reliance on centralised exchanges and to speed up transactions. The New Zealand gateway for ripple is Coinex.
Regulators have been slow to respond to the challenges of virtual currencies. Strong negative reactions to bitcoin have come from Iceland, where bitcoin exchange is illegal, and from China, which has barred financial institutions and payment processors from using bitcoin. The US Financial Crimes Enforcement Network (FinCEN) has released guidance, that has been actively enforced, requiring virtual currency exchanges to comply with legislation countering money laundering and the financing of terrorism.

In New Zealand, bitcoin has been largely ignored by regulators. The Reserve Bank has stated that it will not regulate bitcoin as it does not involve the issuance of physical circulating currency. New Zealand’s financial super-regulator, the Financial Markets Authority (FMA), which among other things oversees financial markets and financial service providers, and monitors compliance with anti-money laundering legislation, has remained silent on bitcoin.
Organisations should consider embracing gamification to enhance graduate selection and recruitment.

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Carole Tansley
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What is your biggest weakness?
Give an example of a time when you had to...
Where do you expect to be in five years’ time?
How do you manage your time and priorities?
Give an example of a time when you showed...
Give an example of your lateral thinking...
What motivates you?
Why do you think you will be successful in this job?

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