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Blockchain and Cryptocurrency for Business

This white paper looks at the emerging paradigm of blockchain and cryptocurrency, challenges they face and solutions that are emerging to meet these challenges.

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Understanding how blockchain and cryptocurrencies work

What is a blockchain?

To get a handle on the concept of a blockchain, you can imagine it as a ledger book, or database, that's available for all to see. It is a shared resource that is replicated across the entire user network, constantly evolving and constantly being validated.

When a transaction is made, the record of this (both parties, exchange of value, date, and more information on some blockchains) is applied to the blockchain. This record remains forever and presents the ultimate in transaction transparency and auditability.

The blocks in the blockchain are groups of transactions made within a specific timeframe. Like adding new lines to a ledger, these blocks are processed, validated, and then added to the historic blockchain by multiple agents at the same time.

Yet, blockchain technology is capable of much more. Technologies such as Ethereum extend their blockchain network to support the running of programs on it, which benefit from all the security and robustness of the

underlying blockchain. Such programs, or decentralised apps (Dapps for short), are set to run until specific conditions are met – impervious to interference.

What are cryptocurrencies, and can we have a blockchain without them?

The Cryptocurrencies are tokens, used to represent value exchanged through transactions on a blockchain. As blockchains are essentially databases of transactions, they require some kind of token (or coin) exchange to record the transactions of. Cryptocurrencies can be thought of as purely electronic currencies.

Bitcoin is the first, and (currently) largest, cryptocurrency. Bitcoin has its own blockchain – a distributed ledger book for all Bitcoin transactions, ever. With over 18.5M bitcoins in circulation, this is a long ledger book, and growing longer by the day.

Blockchain technology is far broader than just bitcoin. Whilst the original blockchain concept was created by the mysterious Satoshi Nakamoto to enable bitcoin transactions to be incorruptibly recorded, this is just one example of the application of a blockchain.

Blockchain technology has spawned almost a thousand 'alt-coins' (non-bitcoin cryptocurrencies), each with its associated blockchain. In many respects, bitcoin is an extremely limited application of a blockchain.

What is mining?

The coins in any cryptocurrency are 'mined' rather than 'minted'. The process of mining varies between currencies and their corresponding blockchains, but typically (as is the case with bitcoin) coins are mined by using dedicated computers to validate transactions, recorded by the network, and write them into the blockchain in a secure fashion.

It's a little more complex in practice, as transactions are grouped into 'blocks' which are added to the blockchain. To ensure a block isn't tampered with, and to validate the previous block (and preceding chain), a process called 'hashing' is implemented. This is what requires the computing power associated with mining.

Miners apply a mathematical formula to all the data in a block, transforming it into a seemingly random sequence of letters and numbers – called a hash. This hash is far smaller than the block and is stored alongside that block, right at the end of the blockchain.

Other data is also used in the algorithm to produce the hash. One of these items is the hash of the previous 'last block' in the blockchain. In the use of this, miners validate the last block in the previous chain and, by extension, the whole chain. Tampering with a block would make the subsequent block's hash wrong, and so on, all down the chain – immediately raising the alert to foul play.

With bitcoin, another piece of data used in creating the hash is called the 'nonce' – this is the one element that miners can control. This is used to tweak the resultant hash.

Bitcoin stipulates a certain format for acceptable hashes – having a certain number of zeros at the start. So, bitcoin miners strive to achieve this format quickly by hashing the same block with many different variations on the nonce used. The first miner to successfully achieve and circulate this is the winner and earns a specific number of bitcoins. As there is no way to know how a hash will look from the combination of a particular set of transaction data with a particular nonce, the full hashing process must be run many, many times until a miner reaches the desired output.

This process is called Proof of Work (PoW). In many ways, it is this work that is seen to attribute material value to bitcoins; the cost of the electricity and processing equipment to do this work. This point borrows a formulation of value from Karl Marx's [Capital](#) and is often overlooked by economists arguing against the intrinsic value of bitcoin as a currency.

Power consumption from mining

As you may appreciate, the vast majority of the computing power spent trying to hash the latest block and mine the next coin(s) is wasted. Only the winner has actually consumed

energy to further the blockchain. Other miners, competing to produce the ideal hash for the latest block, have strived in vain, as there is only one winner selected to create the block. The energy consumption and subsequent wastage involved here is enormous. Thankfully, a solution is being rolled out on some blockchains, such as Ethereum 2.0, where a Proof of Stake (PoS) approach is taken instead of PoW.

PoS takes into account other factors to choose who the creator of the next block is. These factors are typically a random combination of wealth (number of coins held) and age – hence the term 'stake'. Different blockchains have, or are planning for, different variations on how these factors are used to choose the next block creator – with importance given to ensuring the choice cannot be unfairly skewed.

PoS removes the competition for block creation, vastly reducing the resources consumed. In this age of stretched resources and concerns for environmental well-being, this more energy-efficient process is seen by many as the only responsible direction for cryptocurrencies to evolve in.

An interesting side note here is that the advent of quantum computing is set to make the hashing process for PoW incredibly quick and efficient and may even present an alternative route to more rapidly find the ideal hash to win the competition to create the

next block. For this reason alone, it's likely that PoS will ultimately prevail, in some form or other, as the best route to choose who creates blocks.

PoS takes into account other factors to choose who the creator of the next block is.

Why blockchain and cryptocurrencies are relevant to business

Blockchain

Blockchain presents a superb complement to most business's needs to store, secure, and access transactional information and determine ownership and attribution of value. Every business has transactional activity, as well as the exchange of value and ownership, at the core of its operation. Blockchains present an extremely secure, robust, and transparent way to store this information.

Outside of the conceptual revolution that blockchain presents to business, cryptocurrencies are set to become an important consideration for the transfer of value, whether or not businesses build blockchain technology into their core offering.

Cryptocurrencies

Cryptocurrencies such as bitcoin are becoming acceptable tender within some industries, with PayPal adding bitcoin in 2020 and some leading investment funds diversifying their holdings to include bitcoin. Even centralised banks are considering holding bitcoin to hedge against inflation now.

The XRP Ledger, from Ripple, is already in use for cross-border transactions by more than a third of the world's largest banks, such as HSBC, Bank of America, and Crédit Agricole. Businesses already benefit from the faster transaction times and lower processing fees that these currencies offer.

Smart Contracts

Beyond the shared ledger benefits from blockchain, and the financial efficiency of cryptocurrencies, another aspect of blockchain technology presents a bright opportunity for businesses to capitalise on: Smart Contracts. One of the most widely referenced definitions of a smart contract is that by Vitalik Buterin (founder of Ethereum): "A smart

contract is a mechanism involving digital assets and two or more parties, where some or all of the parties put assets in and assets are automatically redistributed among those parties according to a formula based on certain data that is not known at the time the contract is initiated."

A smart contract could be the exchange of a certain volume of currency if ownership of an item changes to a specific individual, e.g. the sale of a house. Setting a smart contract to run on a decentralised network (e.g. the Ethereum network) would guarantee that when the specified criteria are met, the specified outcome would be activated by the contract. Because smart contracts are decentralised and leverage the blockchain, they are resilient to hacking and unauthorised modification after the contract is deployed.

Decentralised Finance

Decentralised Finance, or DeFi, has gained considerable traction since early 2020 with almost 20 percent of all cryptocurrencies (by value), more than \$25bn, being used for this purpose in late-January 2021. DeFi takes the concept of smart contracts and uses them to replace traditional financial services – spanning borrowing, lending, and all manner of trading processes. Many DeFi contracts leverage stablecoins – altcoins that are backed by an equivalent value of a material commodity or fiat currency – to get

around the volatility inherent in the nascent cryptocurrency markets.

The benefits and appeal of DeFi come from the removal of the human element from financial exchanges. Such so-called trustless transactions are algorithmically assured to happen if specific conditions are met, free from tampering, high-speed, and devoid of red tape, and the associated costs.

Market challenges facing blockchain and cryptocurrencies

Many comparisons are made between blockchain technology and the Internet. One aspect that is sometimes compared is the relative maturity of blockchain tech, for the level of investment, compared to how mature the Internet was before venture capitalists began investing heavily in .com start-ups.

The Internet had the benefit of incubating and evolving in the hands of academic and non-profit organisations for decades before the .com boom. Huge volumes of investment are flowing into blockchain startups already, when the technology is barely a decade old. To quote Joichi Ito of MIT Media Lab, "We're investing as if it's 1999, but the standards are 1989."

The immaturity of blockchain technology, and the cryptocurrencies

which are a part of this, presents a need for thoughtful governance to nurture it to its full potential, with the minimum of fallout along the way.

Whilst the maturity and associated risks are felt strongly for some cryptocurrencies, others appear to be edging ahead in terms of community confidence. For example, back in 2017, blockchain publishing company CoinDesk reported that in a survey of 1,100 virtual currency users, 94 percent stated they were positive about the state of Ethereum, while only 49 percent were positive about [bitcoin](#).

It's still early days in the evolution of blockchain standards, policy, and watchdog networks. However, businesses are keen to invest and capitalise on the new opportunities that blockchain and cryptocurrencies present for them. It becomes a regulatory challenge to ensure mistakes aren't made in these early days.

Regulatory challenges

Blockchain technology offers a uniquely transparent character, through the recording and display of all transactions on a blockchain. In many respects, this is a tangible facet for regulatory bodies to access and review. But blockchain technology is only beginning its life under the regulatory lens. Early attempts to regulate the industry, such as BitLicense, proved too heavy-handed and only served to encourage

companies to move to less regulated locations to conduct their business.

Since BitLicense, regulatory pressures have increased in the industry, with the shutting down of Chinese bitcoin exchanges ahead of the 2017 Chinese elections and the placing of tighter restrictions on movement and mining of cryptocurrencies within the country.

Regulation will not come quickly though, as business development in this sphere outpaces scientific research. The best regulations are applied from a position of deep understanding, something that only comes from scientific research. To apply regulations ahead of understanding the societal and economic implications of the technology may at best stifle growth or at worst lead to mutation and financial fallout.

Crypto-assets, qualifying as "financial instruments" under the Markets in Financial Instruments Directive (e.g. tokenised equities or tokenised bonds), have already in the past been subject to EU securities markets legislation. However, crypto-assets that qualify as utility or payment tokens (i.e. currency) are still not fully regulated. Plans are taking shape, with the Markets in Crypto-Assets Regulation ([MiCA](#)) proposal set forth on 24th September 2020 and accompanied by [this press release](#).

Market challenges

For all the concern about damage to this young technology through inappropriate regulation, it faces one of its greatest challenges from one of its most active communities: the financial sector. Many of the apparent benefits of cryptocurrencies and blockchain technology stand to erode traditional revenue streams in the financial sector. And money talks.

When you consider the amount banks are paid to handle financial transactions, and how blockchain technology (particularly DeFi) promises to make these transactions more efficient, detracting from the profitable services around this, it's not hard to see why the financial sector will be keen to steer the evolution of blockchain and cryptocurrency where they can.

The R3 consortium (comprising more than 70 of the world's largest banks) is already heavily invested in blockchain database research. However, R3's Corda platform is not actually a blockchain platform, although it contains a shared ledger and presents many of the benefits of blockchain platforms, albeit without the same level of openness. It remains to be seen how amenable the financial sector will be to the ingress of blockchain and cryptocurrency in other areas, and whether they will interface directly with solutions based on this new technology emanating from different market sectors (e.g. technology vendors).

How secure are these technologies?

Security is one of the best angles to mitigate against the concerns raised by financial and legal integration. Blockchain technology provides transparency and auditability, as well as extreme resilience, to attack and specifically fraud. The distributed processing and validation make blockchains impractical to hack – as a hacker would need to pose as a vast number of users, all in agreement, all processing heavy transactional loads concurrently.

By storing identical blocks of information, distributed across a network, a blockchain has no single point of failure. The entire content of a blockchain is stored many, many times over, across a broad physical area, with checks to ensure ongoing integrity.

The broader the distribution network, the more power would be required to simultaneously edit all identical historical records. Tampering with less than all identical records would be spotted as the blockchain is constantly being verified against copies of itself through the process of adding new blocks to the chain.

Making use of blockchain and cryptocurrencies

Despite the looming challenges faced, businesses realise that blockchain and cryptocurrencies represent a rare opportunity to create a competitive difference. Parallels with the Internet have many businesses and investors excited about the opportunities for blockchain pioneers and early adopters. Before 2015, investments in blockchain by major financial institutions were rare. However, in 2021 it is gathering pace; supported by big tech players like IBM with their 1,600 experts working on 500+ blockchain projects.

This groundswell of interest and investment is driving innovation forward at an incredible pace in terms of both cryptocurrencies and associated solutions to integrate these, not to mention blockchain technology in the broader sense, within businesses.

Such is the desire to develop at speed, without pausing, that Matthew Roszak, Co-founder of Bloq Inc. [describes](#) bitcoin as being “like a car going down the road at 1,000 mph” where “developers are not the drivers of this car, yet they are tasked with repairing and upgrading this car without turning it off, stopping it or rebooting it.”

David Treat, Managing Director of Accenture’s Capital Markets Blockchain practice, also [paints a picture](#) of the urgency felt in the field, “There are lots of discussions about interoperability, but with limited progress to date as the primary platforms and codebase creators are still focused on achieving their first production versions and building market share. Given current progress on the first wave of production systems, making progress on interoperability is growing in urgency.”

It’s likely that the more flexible and expansive blockchains, such as Ethereum, will take centre stage as solutions are developed to run on them. One high-profile example is the People’s Republic of China, which has already been experimenting with Ethereum to develop a [digital yuan](#).

Beyond specific currencies, Hyperledger is leading the way as an open-source project to develop blockchain frameworks and platforms for business. Hosted by the Linux Foundation, Hyperledger is seeking to duplicate the success of its host organisation by creating standardised frameworks to accelerate future blockchain development.

For businesses outside the world of blockchain and cryptocurrency solution development, but keen not to miss out, it won’t be long before partners emerge to offer integration of benefits from this world with standard business processes. Any business process involving the

transfer of funds, e.g. e-invoicing, lends itself to cryptocurrency support – improving efficiency, security, and visibility of fund transfers.

Businesses will do well to evaluate these emerging platforms for the greatest degree of interoperability and ask themselves:

- + Which cryptocurrencies will they enable the business to accept?
- + How extensible and adaptable will these be over time?

Closed systems that offer benefits but lock the business into working with a subset of the potential audience may prove limiting as the market evolves at an escalating pace.

Conclusion

Blockchain technology promises a revolution in transactional business processes, enhancing accountability through transparency and streamlining processing performance. But the rate of acceleration towards blockchain utility has been turbo-charged by an unprecedented level of investment in such a young technology.

As technical solutions rapidly evolve towards adoption of blockchain technology for business transactions, they will need to meet a set of regulations that are struggling to keep pace (at least initially) with the

rate of technical evolution. Different sectors are set to evolve at different rates. The juncture of finance and technology is likely to form the crucible from which the most advanced developments arise, but blockchain will face challenges in areas where it threatens to streamline and therefore erode incumbent financial services.

For most businesses, outside of the purview of the finance and technology industries, solutions will emerge to streamline financial processes, as well as improve transparency and increase resilience.

Businesses will need to navigate these emerging solutions carefully, selecting for business process enhancement and the greatest possible interoperability, or risk losing market share as competitors adopt more open solutions.

Solutions like Corcentric EIPP, which offers open integration with any payment provider and the ability to deliver invoices in any electronic format, are the ideal way to prepare for future integration with blockchain invoicing and their remittance via cryptocurrency or traditional means. There is, without doubt, a revolution occurring. But revolutions have winners and losers, so choose your partners in this space carefully.

About Corcentric EIPP

Corcentric EIPP is a managed service dedicated to streamlining, automating, and enhancing business invoicing, from delivery through to payment. Corcentric EIPP ensures accurate and efficient delivery of invoices to your customers in the medium which suits them.

Beyond saving time and cost through invoice automation, Corcentric EIPP enables a risk-free and seamless shift towards electronic invoicing, reducing errors and driving down DSO.

Corcentric EIPP also removes the classic challenges of document storage and retrieval for auditing and compliance. Businesses depend on Corcentric EIPP to provide secure online access to their document distribution history, facilitating ease of reporting, performance analysis, and proof of delivery, along with a range of other document management functions.

Headquartered in the United States, Corcentric helps more than 2,000 of the largest companies leverage smarter technology and services to reduce operating costs, improve cash flow, and unlock the hidden value within their enterprise.

Spend smarter,
optimize cash flow,
and drive profitability.

Corcentric is a leading provider of procurement and finance solutions. We help companies reduce costs and improve working capital by optimizing the way they purchase, pay, and get paid.



CONTACT:
E-Mail: eipp@corcentric.com
Phone: +44 20 3868 0216

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