



GLOBALM&A
PARTNERS

A graphic of a globe with a network of blue lines and dots connecting various points across the continents, symbolizing blockchain technology. The text 'BLOCKCHAIN TECHNOLOGY' is overlaid in white, bold, sans-serif capital letters.

BLOCKCHAIN TECHNOLOGY

**Technology
Newsletter Q1'18**

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1. BLOCKCHAIN

Overview

Blockchain is a digitised, decentralised, public ledger of all transactions or asset holdings. The technology works through the process of mining that involves adding transaction data to cryptocurrency's global public ledger of past transactions. Every node (computers that connect to a cryptocurrency) has access to this public ledger of transactions that acts as an authoritative record. Every node in the network, acting on the information, come up to the same conclusions and is able to replicate the same ledger.

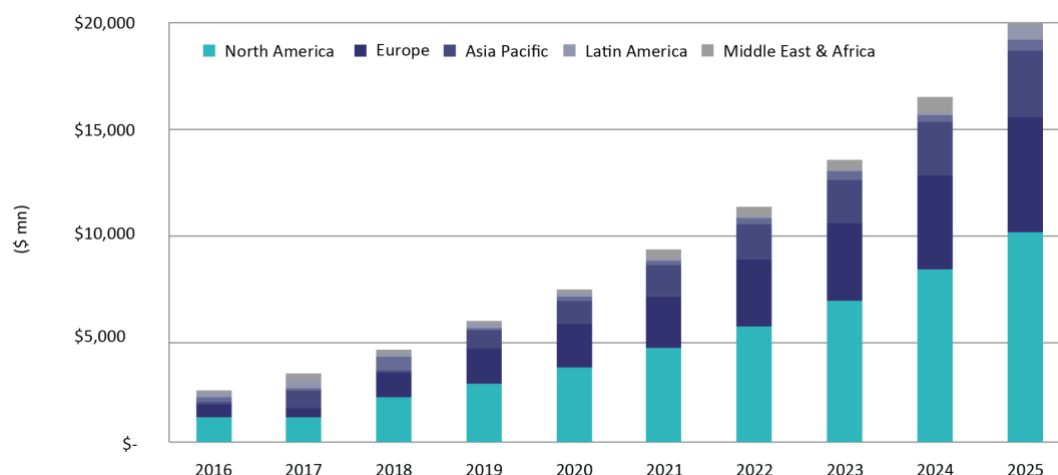
The mining mechanism allows the blockchain to be a decentralised security. Miners validate new transactions in a block and record them on the global ledger (blockchain). A block is the 'current' part of a blockchain, which records some or all of the recent transactions. Once completed, a block goes into the blockchain as a permanent database. There are a countless number of such blocks in the blockchain, connected to each other (like links in a chain) in a proper linear, chronological order.

Every block contains a hash of the previous block. The blockchain has complete information about different user addresses and their balances right from the genesis block to the most recently completed block. The blocks are added through cryptography, ensuring that they remain meddle-proof; hence, the data can be distributed, but not copied. On average, a block (the structure containing transactions) is mined every 10 minutes. Miners compete to solve the algorithm and the solution found is called the Proof-of-Work. When a block is solved, the transactions contained are considered confirmed, and the cryptocurrency in the transactions can be spent. This replaces the need for third parties/intermediaries (for example, payment gateways like Visa and MasterCard), which are otherwise required to verify or clear transactions.

The process of block addition and blockchain creation allows market participants to keep a track of transactions without central recordkeeping. It is based on a network consensus approach, whereby trust between the parties involved in a transaction is provided by cryptography. This not only reduces the bureaucratic time lag, but also creates immutable transaction and audit trails, which can be analysed by the regulators.

According to a report by Tractica, the annual revenue for enterprise application of blockchain will increase from \$2.5bn worldwide in 2016 to \$19.9bn in 2025, with North America being a consistent leader throughout followed by Europe and Asia Pacific. This revenue includes various industries from cryptocurrencies and fintech to healthcare and supply chain.

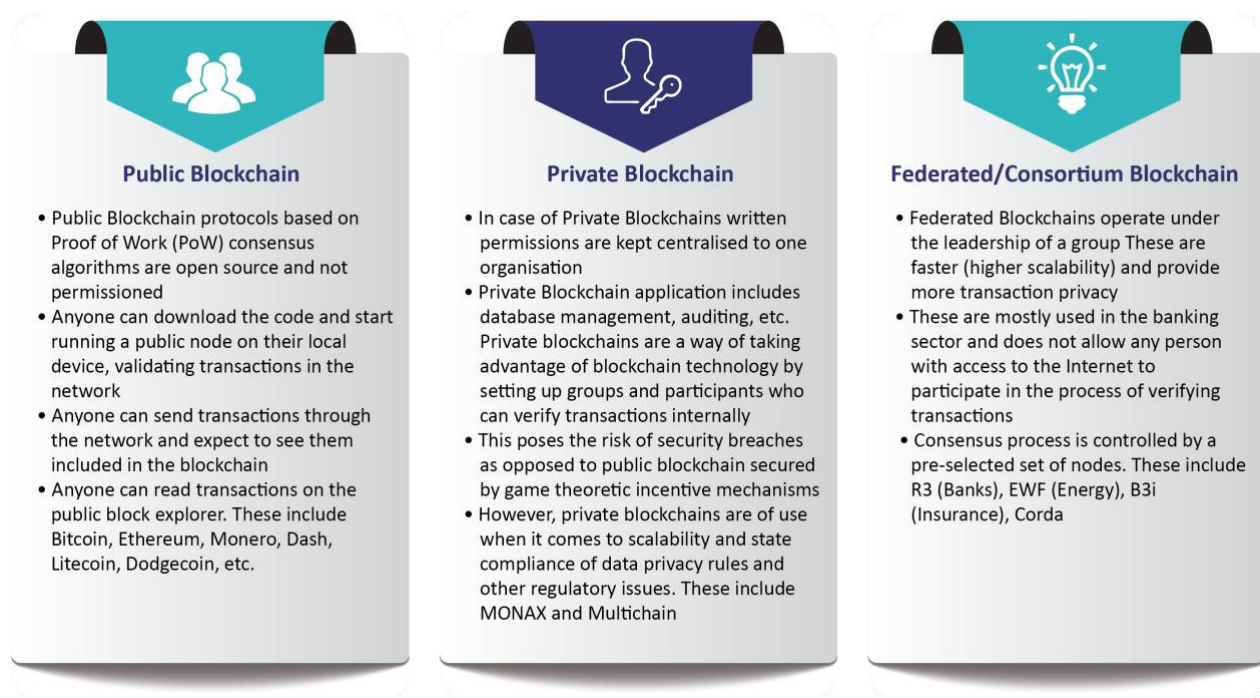
Blockchain Revenue by Region, World Makrts: 2016-2025



Source: Tractica

Blockchain Platforms

Blockchain is widely used for any kind of value transaction or agreement (P2P insurance, trading, ride sharing). Because of its wide arena of utility and versatility, several companies/start-ups started creating their own blockchain with different properties. A good example demonstrates the involvement of other industries, for example, the signing of Barclays with two blockchain start-ups (Wave and Chainanalyse) for trade finance and compliance screening. Also, private institutions such as banks also utilised the idea of blockchain as a distributed ledger technology (DLT) and created permissioned blockchain (private or federated), where the validator is a member of a consortium or separate legal entities of the same organisation. They can be classified broadly into three categories as given below.



Secured Payments

The security of the transactions is the key characteristic of blockchain and the primary reason for its wide popularity. Various measures that it adopts for a transaction are listed below:

- **By decreasing uncertainty about who you're interacting with during a transaction:** Blockchain allows sellers and buyers to permanently upload verified personal documents, such as a government-issued driver's license, a contractor's license or a credit score. This gives both buyers and sellers credible information to help them make decisions and transact together online.
- **By making transparent what is being bought and sold:** Blockchain will remove the possibility of a counterfeit product by enabling retailers to post verifiable documentation for their supply chain, such as which factory and what materials were used to make a product. In this way, consumers can monitor and validate the supply chain themselves.
- **By providing built-in recourse for unfulfilled contracts:** Blockchain technology can program conditions, such as a buyer receiving an undamaged product, before their funds are released to the seller, therefore minimising the chances of delivery of counterfeit products.
- **By increasing the speed of a transaction:** The absence of a third party enhances the speed of the transaction and also increases the transparency of the same.

- **By making 'value' native to the internet:** By adopting blockchain technology, the internet will evolve to include 'value' as an exchange unit. As the internet evolves so that value and trust are traded as currency, it will become a safer place to do business.

Transaction Fee

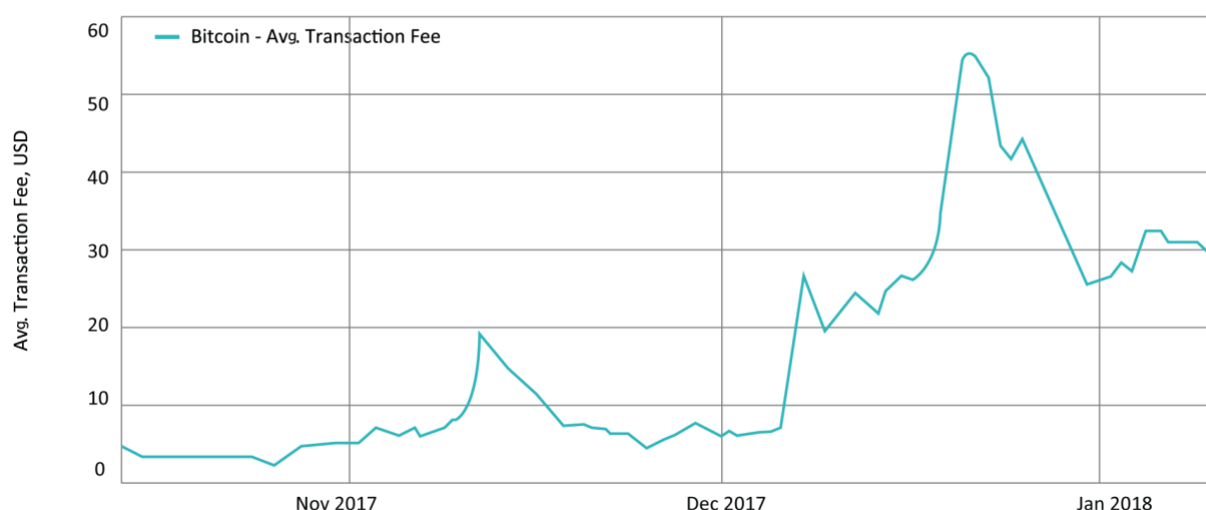
Mining is the mechanism that allows blockchain to be a decentralised security. It is mining that validates new transaction and records on blockchain. Miners compete to solve difficult mathematical equations (hash functions) for which they receive a reward. There are two types of rewards: new bitcoins or transaction fees. The amount of bitcoins created decreases every 4 years. Presently, a newly created block creates 12.5 bitcoins. This number will keep going down until no more bitcoin will be issued. This will happen around 2140, when around 21.0mn bitcoins will have been created.

The amount of bitcoin created with each mined block is given below with their time periods.

Before Nov 2012	Nov 2012 to Jul 2016	Jul 2016–2020	2020–2024	2024–2028	2028–2032	2031–2036	2036–2040	2040–2044	2044–2048
50	25	12.5	6.25	3.125	1.5625	0.78125	0.390625	0.1953125	0.09765625

These miners can also receive rewards in the form of a transaction fee. Transaction fee dynamics are set by supply and demand. This fee (set by the miner) is dependent on various factors: the volume of bitcoin transactions in the processing queue, block size and capacity, current processing power in the network and the speed at which a transactor desires a transaction to be confirmed. As the number of bitcoin awarded to miners for new blocks decreases over time, transaction fees are expected to increase to offset the mix shift of mining income. Given below is the bitcoin average transaction fee for the last three months. A considerable drop in the month of January (2018) can be attributed to the decline in the number of transactions (that could be due to saturation of the market). The rise and fall are just the function of a speculative frenzy around the bitcoin asset.

Bitcoin Average Transaction Fee (Last 3 Months)



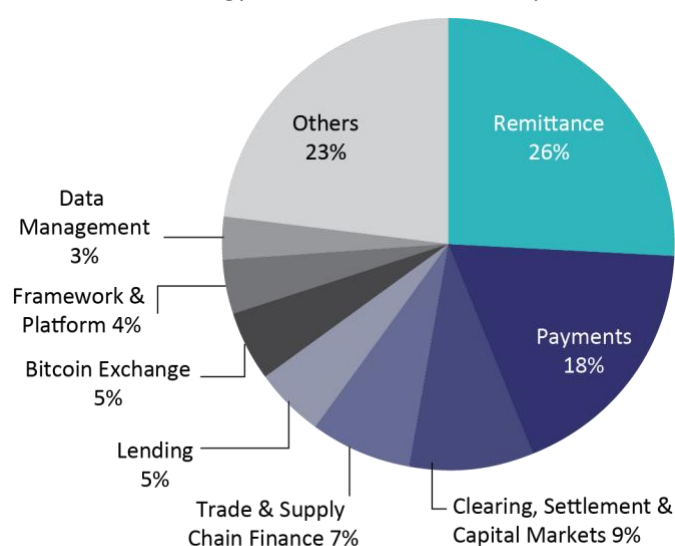
Source: bitinfocharts.com

2. KEY DIFFERENTIATING FACTORS OF BLOCKCHAIN TECHNOLOGY

- **Ease of Accounting and Immutability of Record:** Recording transactions through blockchain virtually eliminates human error and protects the data from possible tampering. Records are verified every single time they are passed on from one blockchain node to the next.
- **Faster Transaction Settlement:** When it comes to traditional banks, a transaction takes days to completely settle. Comparatively, blockchain technology is working 24 hours a day and 7 days a week, which means blockchain-based transactions process considerably more quickly.
- **Decentralisation:** Instead of running a massive data centre and verifying transactions through that hub, blockchain actually allows individual transactions to have their own proof of validity and the authorisation to enforce those constraints. With information on a particular blockchain piecemealed throughout the world on individual servers, it ensures that if this information fell into unwanted hands, only a small amount of data, and not the entire network, would be compromised.
- **Transparency:** One of the prime reasons for blockchain to gain prominence is that this technology is almost always open-source. Other users or developers have the opportunity to modify it as they see fit. However, it makes altering logged data within a blockchain difficult, which makes blockchain secure.
- **Smart contracts:** One of the most promising applications of the blockchain technology is the smart contract. These are self-executing commitments, fulfilment of which can be trusted. Smart contracts and agreements can be automatically validated, signed and enforced through a blockchain construct. This eliminates the need for mediators, saving time and money. Obligations codified by smart contracts are easily replicable, and have the benefit of security, verifiability, translucency and immutability of the blockchain.

Blockchain Opportunities in Different Industries

Although blockchain is familiar for its use in cryptocurrencies, numerous industries are already using (or building a framework to use) this technology because of its versatility.



Source: Asian Banker's REsearch



Financial Services

Investment banking and transaction services are the most promising fields of blockchain application in the near future.

Payment Transactions

Within the field of payment transactions, the technology could be used to overcome current problems of correspondent banking systems and international money transfers. The fee-intensive and fragmented processes of cross border, non-cash transactions could be eliminated by the exclusion of third parties, direct money transfers and efficient interbank settlements. The possibility of creating a competitive marketplace of liquidity providers potentially ensures the best exchange rates for international exchange and payment transactions.

Trade Finance

As trade finance is one of the segments in financial services that could not keep up with technological developments and digital evolution, the blockchain technology could induce a needed transformation. The current legal situation in trade finance could be transferred to the blockchain, which would create strong legal certainty.

OTC Market

The blockchain technology could redesign the OTC market infrastructure and lead to the elimination of obsolete market participants. Huge cost savings might be possible by using smart contracts that could automate the execution of OTC agreements. Direct trade without trusted parties could be executed, whereby customers no longer need to depend on their brokers. This technology has the potential to reduce settlement risks by enabling almost instant settlements and avoiding latencies of about T+3 days.



Manufacturing Industry

Packaging

Blockchain is innovating to mediate between designers, print service providers and end users, thus making license management safer — from generating print data to the exchange between service providers and the marking of work pieces.

Internet of Things and Industry 4.0 applications

Blockchain assists for IoT device identification over blockchain, sensors that timestamp data on the blockchain to save them from manipulation, marketplace to allow customers to sell their data from IoT devices, cryptocurrency and blockchain protocol developed to meet the demands for IoT applications and as a platform to save selected IOT data on a private blockchain and share it with all involved business partners.



Supply Chain and Logistics

The blockchain has proven to be a way of connecting the different parties involved in any supply chain environment due to the transparency and security-by-design of the technology. It helps in registering the transfer of products on the digital ledger as a transaction allows identifying the main data relevant to manage the supply chain. The main features of blockchain useful for application in the supply chain are:

- Blockchain could be of great utility in tracking of containers during the shipping process, recording of all important product information throughout the entire supply chain and registering certifications and transaction history of diamonds on blockchain.
- Public availability gives the opportunity to track products from the place of origin to the end customer.
- A decentralised structure gives the ability for participation to all parties in the supply chain.
- A cryptography-based and immutable nature gives the assurance of security.



Insurance

In the banking industry, blockchain is actively implemented across several sectors, ranging from customer-facing payment technology to trading and exchange services. While the insurance industry (in terms of technology adoption) lags behind banking, it is uniquely positioned to benefit from the blockchain technology as it can address the competitive challenges that many incumbents face, including poor customer engagement, limited growth in mature markets and the trends of digitisation.



Healthcare Industry

As the industry evolves alongside emergent market-disruptive technologies, it becomes increasingly difficult for businesses to keep costs down while remaining competitive, along with numerous federal regulations adding to the industry pressure. Blockchain has the potential to alleviate one of the major challenges of the industry: the transmission of patient data across geographies without compromising its privacy and security. The main functions with specific key items are listed below:

- **Fragmented Data:** Decentralised storage using computer networks for patient data, shared data across network and nodes, and decentralised source of IOT data.
- **Timely Access to Patient Data:** Distributed, secure access to patient health data across the distributed ledger and shared data enables real-time updates across the networks.
- **System Interoperability:** Decentralised internet and computer networks across geographies, which also enables authenticity.
- **Data Security:** Digitising data security of transactions – digital identity protects patient privacy.
- **Patient-generated Data:** Data from wearable devices (IoT) aggregated to provide holistic patient care.
- **Access and Data Inconsistency:** Smart contracts create a consistent and rule-based method for accessing and analysing patient data that can be granted to select health organisations.

- **Cost Effectiveness:** Reduced transaction costs and real-time processing to make the system more efficient and elimination of third party applications remove time lag in data access.



Energy Supply

Commercial establishments and households have started to take advantage of blockchain-enabled 'transactive grids' for sustainable energy solutions that accurately track usage. Examples include Powerpeers in the Netherlands and Exergy in Brooklyn. The technology can also be used to improve the tracking of clean energy.



Stock Exchange

Given the open-yet-reliable nature of blockchain systems, stock exchanges are now considering using blockchain technology for securities and commodities trading. A Goldman Sachs report suggested that it could save stock market operators up to \$6.0bn a year, by adoption of blockchain technology. For example, Australia's stock exchange is set on switching to a blockchain-powered system for their operations, which is designed by the blockchain startup Digital Asset Holdings.

3. BLOCKCHAIN IN CRYPTOCURRENCIES

A cryptocurrency is a digital version of fiat currency such as the USD or GBP. The blockchain technology enables the existence of cryptocurrency. It is a unifying factor for cryptocurrency, which is able to establish identity and ownership, record transactions and enforce 'smart contracts'. In other words, it is a digital currency that is mined instead of printed.

Bitcoin, Ethereum (ETH), Dash, Monero, Ripple and Litecoin are some examples of the largest cryptocurrencies. Although bitcoin remains the dominant cryptocurrency in terms of market capitalisation, other cryptocurrencies are increasingly cutting into bitcoin's historically dominant market cap share: while bitcoin's market capitalisation accounted for 86.0% of the total cryptocurrency market in March 2015, it has dropped to 33.0% as of January 2018. Ether (ETH), the native cryptocurrency of the Ethereum network, has established itself as the second-largest cryptocurrency. The combined 'other cryptocurrency' category has doubled its share of the total market capitalisation from 3.0% in 2015 to 6.0% in 2017.

Crypto Exchanges

Cryptocurrency exchanges are digital marketplace where traders can buy, sell or exchange cryptocurrencies for other digital currencies or traditional currencies such as US dollars or Euro. Professional traders can use an exchange that requires verification of ID and opening of an account. Occasional traders can use various available platforms that do not require an account. Many exchanges offer a lot of money deposit options such as BTC, credit card, wire transfer, etc. By far, Coinbase, Kraken, Cex.io, ShapeShift, Poloniex, Bitstamp, Coinmama, Bitsquare and Gemini are the major crypto exchanges available.

Types of Exchanges



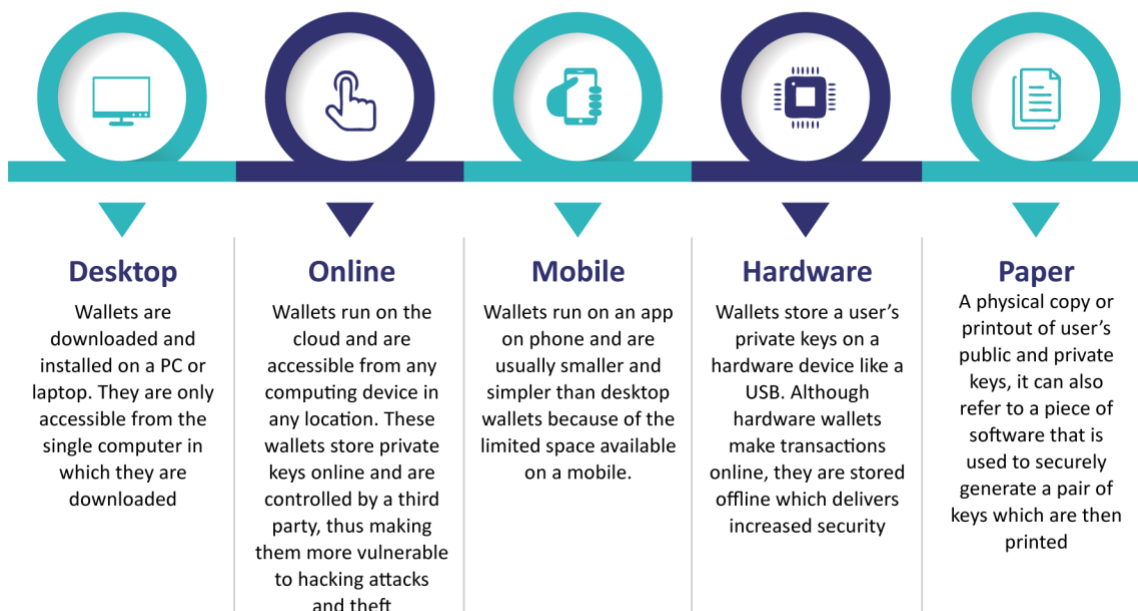
Crypto Wallets

Crypto Wallets are digital wallets that interact with various blockchain platforms to enable users to send and receive digital currency and monitor their balance. They do not store currency but maintain a record of transactions stored on the blockchain.

Crypto wallets are software programs that store private and public crypto keys. When a person sends bitcoins or any other type of digital currency, they transfer ownership of the coins to the receiver's wallet address. In order for the recipient to spend the newly transferred bitcoin and unlock the funds, the private key stored in the receiver's wallet must match the public address the currency is assigned to. If public and private keys match, the balance in receiver's digital wallet increases and that of the sender's decreases accordingly. There is no actual exchange of real coins. The transaction is recorded on the blockchain and a change in balance is reflected in the cryptocurrency wallet.

Between 5.8mn and 11.5mn wallets are estimated to be currently 'active'. The lines between wallets and exchanges are increasingly blurred: 52.0% of wallets surveyed provide an integrated currency exchange feature, of which 80.0% offer a national-to-cryptocurrency exchange service. In contrast with exchanges, a majority of wallets do not control access to user keys.

Types of Wallets



Money Transfer and Mobile Payments in Cryptocurrency

The success of bitcoin has encouraged the emergence of many cryptocurrencies that are used as a means of electronic payment. Their ease of use, low transaction cost and perfect adaptation to the Internet ecosystem has earned them a leading role in the payment system, but they still have very little presence in physical stores. The Ripple protocol, for example, is an open-source distributed ledger (blockchain) application that functions as a payment network supporting a variety of currency exchanges. This protocol allows for the exchange of value in real time, as opposed to a day to clear on the ACH (Automated Clearing House) network.

While 79.0% of payment companies have existing relationships with banking institutions and payment networks, the difficulty in obtaining and maintaining these relationships is cited as this sector's biggest challenge. On average, national-to-cryptocurrency payments constitute two-thirds of the total payment company transaction volume, whereas national-to-national currency transfers and cryptocurrency-to-cryptocurrency payments account for 27.0% and 6.0%, respectively.

Payment Procedures: As payments are made, changes in the ownership of the cryptocurrency are recorded on the blockchain, with every block (containing the hash of previous block) added to the blockchain. The payment infrastructure operates by converting in and out of fiat currency. Yet with the majority of solutions currently requiring consumers to explicitly buy and sell bitcoin or other digital currencies, this creates a substantial barrier to adoption.

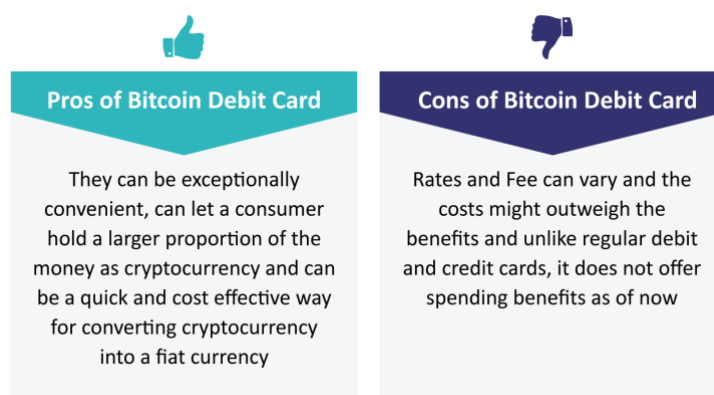
Altcoins: Bitcoin has been criticised by users of the Dark Net for lacking genuine anonymity and providing a trail of evidence for law enforcement to trace payments via its blockchain. This has led to an increase in the development of alternative cryptocurrencies (altcoins) in which anonymity and security is prioritised in order to make the tracing of payments and laundering of proceeds almost impossible.

The impact and usage of digital currencies on wholesale payments have been far less noticeable than in the retail payments sector, yet this is likely to change as cryptocurrencies appear less as stores of value and more as means of reducing friction within the payments process. Information is transparent

(allowing the entire transaction – and therefore, ultimately, ownership – to be tracked), yet protected and unable to be changed.

Debit and Credit Cards – Cryptocurrency

Bitcoin and other cryptocurrency debit cards work just like any other debit card. They can be swiped at card terminals to buy things in-store, used to withdraw cash at ATMs and also for online shopping. Typically, it converts bitcoin into the local fiat currency on the spot, ideally at fair rates and without any additional fees. They're designed to make it easier to directly spend cryptocurrencies as needed, even if a merchant doesn't accept bitcoin payments. The issuers have mobile applications for contactless payments with a Near Field Communication (NFC) checkout terminal as well as physical debit cards for use at the point-of-sale (PoS). The payments are carried out in collaboration with a payment gateway (Visa or MasterCard), making it very convenient for cryptocurrency investors to use their tokens at millions of locations globally. The existing infrastructure provided by payment giants such as Visa and MasterCard is used by cryptocurrency debit cards to enable payments without any additional work at the merchant's end. Thus, the customer pays in a chosen cryptocurrency – say Bitcoin or Ethereum – but the merchant receives the fiat, such as US dollar or Euro.



4. INITIAL COIN OFFERING (ICO) AND FUNDRAISING

ICO is the mechanism of fundraising through which new projects sell underlying cryptocurrencies or 'Tokens' in exchange for other cryptocurrencies (such as Bitcoin or Ether). ICO offers tokens of the projects which provide a unique utility in using the company's product or can be traded for other cryptocurrencies or fiat at a later time. Initial coin offerings are an upcoming trend in blockchain/cryptocurrency community changing how businesses raise capital.

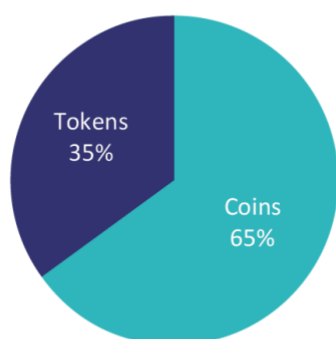
ICO and Blockchain

Blockchain technology is used to issue new cryptographically secure 'tokens' or 'coins' that are easy to transmit peer-to-peer. ICOs could be interpreted as a means of creating digital certificates that have signatures, rules, programs, and other attributes controlled cryptographically, which in turn uses blockchain technology to keep these records, access, monitor and generate/initiate transactions.

IPO (Shares) vs. ICO (Tokens)

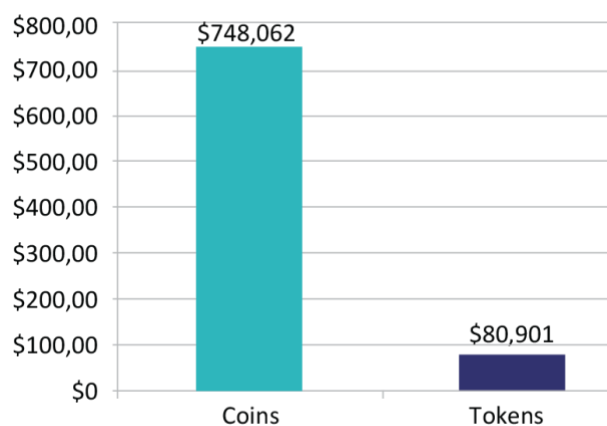
While both ICOs and IPOs are public sales, they involve different assets, and holding them involves completely distinct processes. The key differences between them are: firstly, a token does not have any ownership rights like a share (except for tokenized securities), secondly, in an ICO, the company has a unique technology and business value proposition that relies on the token as a core part of its future operating model. No such thing exists in an IPO, thirdly, the token is sold as a way to incentivize new product users and not as an ownership interest in the ongoing enterprise like a share and lastly, IPOs aim to collect dividends, while ICO's promote adoption of the company and its associated services/platform.

Tokens (478) vs Coins (901)



Source: CoinMarketCap, Credit Suisse research.
Pricing as of 8 January 2018

Market Cap : Tokens & Coins (\$ bn)



Source: CoinMarketCap, Credit Suisse research.
Pricing as of 8 January 2018

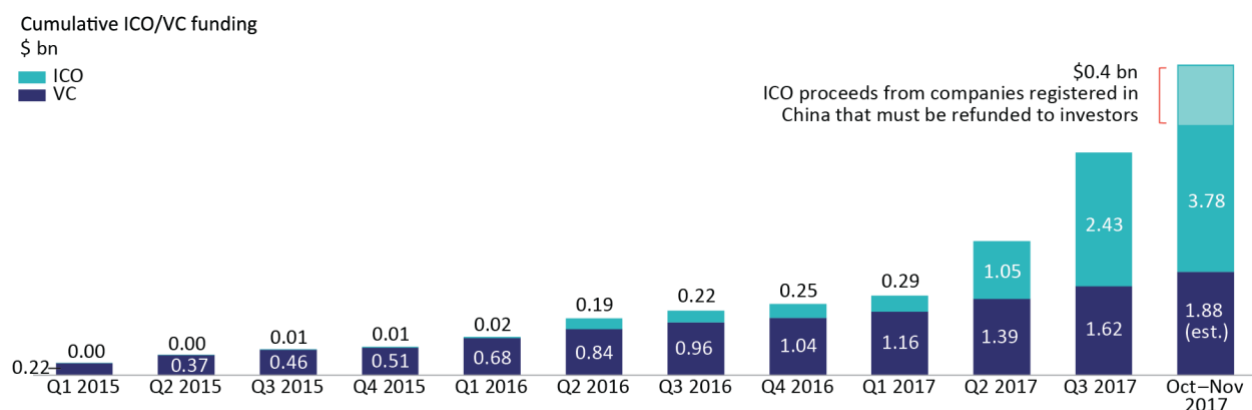
Types of Tokens

	Currency Tokens Digital tokens that act as online currencies that can be used to buy and sell goods and services and can be held as a store of value
	Tokenized Securities Also known as equity tokens or security tokens, represent a share in a company that has completed a token sale. Tokenized securities are similar to stocks and imply ownership and control
	Utility Tokens Utility tokens, also referred to as app coins or user tokens, provide access to a company's platform, product, or service
	Asset Tokens Digital tokens that represent a physical asset or product. A great example of asset tokens would be tokenized gold
	Reputation and Reward Tokens Are given as rewards to users on a platform. They can symbolize a user's reputation or simply a reward for being active on a specific blockchain platform

Industry Snapshot

Indicator	August 2017	September 2017	October 2017	November 2017	1–10 December 2017
Total amount of funds collected, \$mn	330	802.9	822.6	683.5	282.9
Number of companies that completed an ICO ¹	35	48	72	50	21
Maximum collected, \$mn (ICO name)	54.6 (Salt)	257 (Filecoin)	144.3 (Polkadot)	108.2 (QASH)	52.0 (Blockstack)
Average collected funds, \$mn	9.4	16.7	11.4	13.7	13.5
Max token reward (ICO name)	15.18x (Neblio)	6.86x (ICON)	8.11x (Electroneum)	7.99x (Genesis Vison)	n/a
Average token reward (ATR)	2.35x	1.94x	1.89x	2.72x	n/a
Weighted average current reward on funds (WACRF)	1.88x	1.83x	2.08x	2.76x	n/a

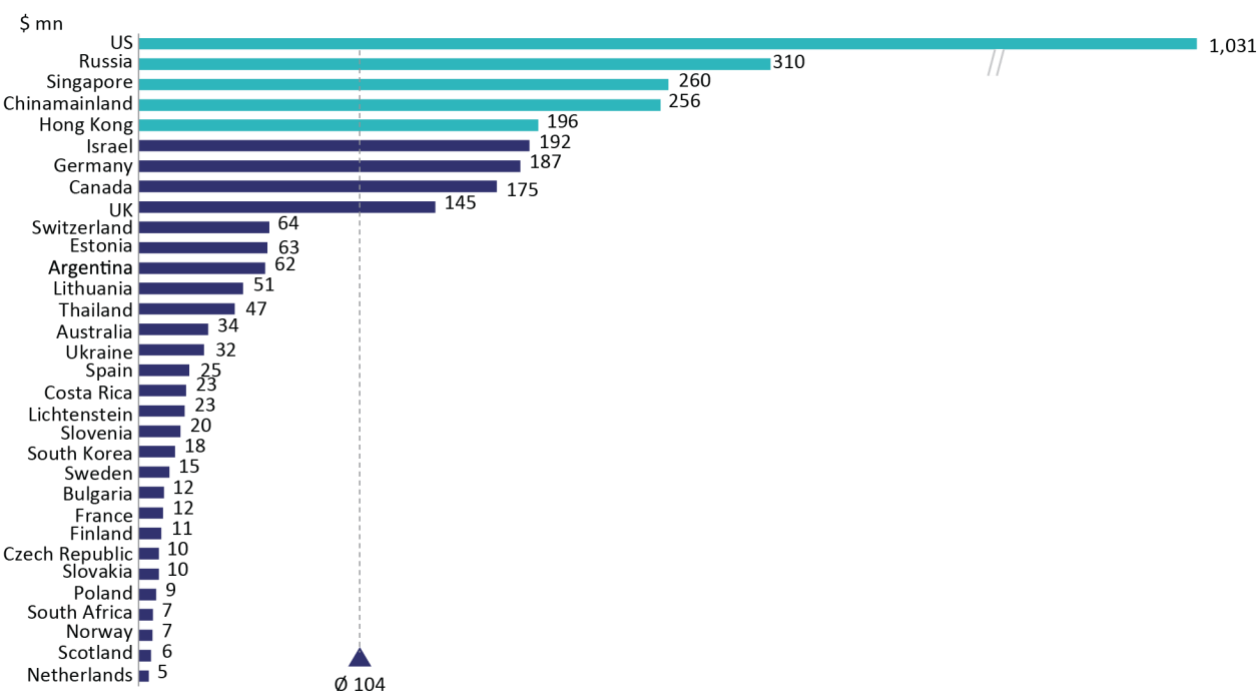
In 2016, more than \$0.68bn was raised through ICOs, globally. This amount grew to \$4.0bn in 2017, which is twice the volume of venture capital (VC) investments in blockchain projects. In November 2017 alone, ICOs yielded an estimated \$740.0mn. The estimates for 2018 vary greatly, but the market is anticipated to continue the increase despite rising regulatory pressure. In 1Q17, 37.0% of blockchain funding came from ICOs, compared to 3.0% in 1Q16. The number of projects conducting an active ICO as of Dec 2017 is 285. The number of ICOs completed rose from 3 in January 2017 to 30 in June, followed by 50 in November the same year. This number was recorded to be 21 from 1–10 December 2017.



Data based on open sources – ICO market is not regulated, there is no standardized reporting and volatility is high.

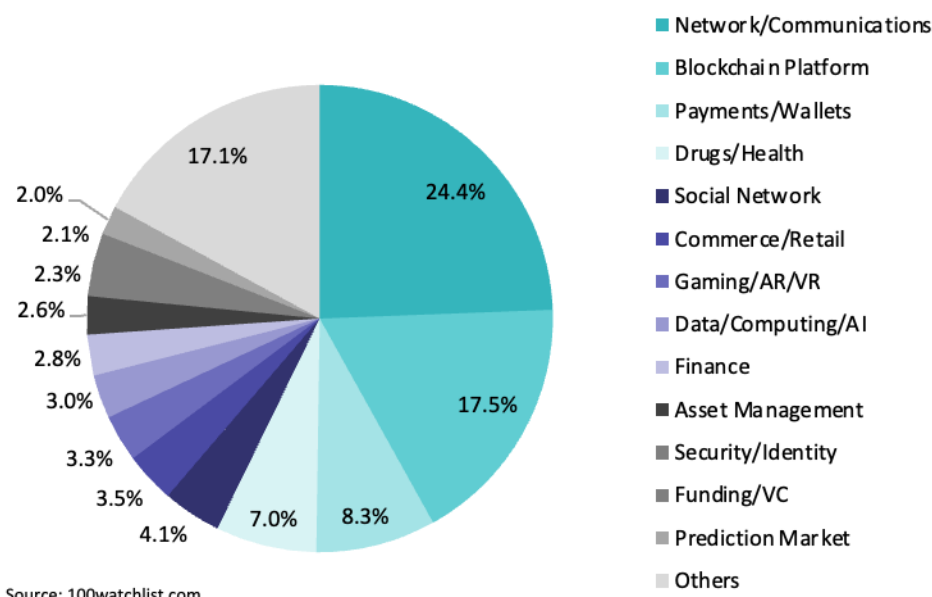
Sources: CoinDesk, CB Insights, IFCERT

ICO projects by country/region/jurisdiction



Source: EY Report

In terms of number of ICOs completed, USA (317) is at the top followed by Russia (225) and UK (147). The top five ICOs in terms of the value of sold tokens are HDAC (\$258mn), Filecoin (\$257.0mn), Tezos (\$232.0mn), EOS (\$185.0mn) and Sirin Labs (\$157.9mn).



The above pie chart shows the distribution of various ICO sectors/industries. The top three sectors standing out with respect to the total USD amount raised per category are Network/Communications (24.4%), Blockchain Platform (17.5%) and Payments/Wallets (8.3%). Some ICO projects overlap industries due to the nature of services they provide and client needs they meet.

Traditional VC crowd funding models have been overtaken by ICOs as the preferred crowd funding method for blockchain-based start-ups. This has allowed successful ICOs such as Bancor, Tezos and EOS to raise millions of dollars. Many of these projects are now in advanced testing phases and beta versions will soon be ready for testing.

Advantages and Disadvantages of ICOs

Advantages	Risks/Disadvantages
Ease of Marketing: Security laws restrict most traditional venture financings only to accredited investors and prohibit marketing publicly. With ICOs, since it is unregulated and not regarded as a security, public offering can be made via press and appropriate marketing can be established.	Lack of Security: The volume of ICOs draws hackers' attention. More than 10.0% of ICO proceeds are lost as a result of attacks. In addition to losing funds and increasing project risk, investor personal data is at risk of being exposed.
Liquidity: As long as there is a functioning crypto-exchange, tokens are much more liquid than private company stock.	Tax Liability: When a company raises money through ICOs, the proceeds are treated as revenue, and therefore subject to tax unlike selling equities.
Transparent: As crypto markets are more transparent, global asset prices could be seen in near real time.	Irrecoverable Loss: In case of loss of private key for the crypto wallet, the entire belongings are lost and are irreversible.

5. TRENDS IN BLOCKCHAIN

Blockchain — IoT Implementation

The blockchain technology has the potential to provide a scalable and secure security framework for IoT. In 2018, blockchain is likely to see greater levels of integration and implementation within the global IoT construct due to the need to eliminate all single points of failure from the new digital infrastructure. Blockchain has already proven to be a robust decentralised model that prevents malicious attacks through single points of failure. With data integrity being an even greater concern to the fidelity of the IoT, it is beyond doubt that blockchain will play a leading role in its development in 2018.

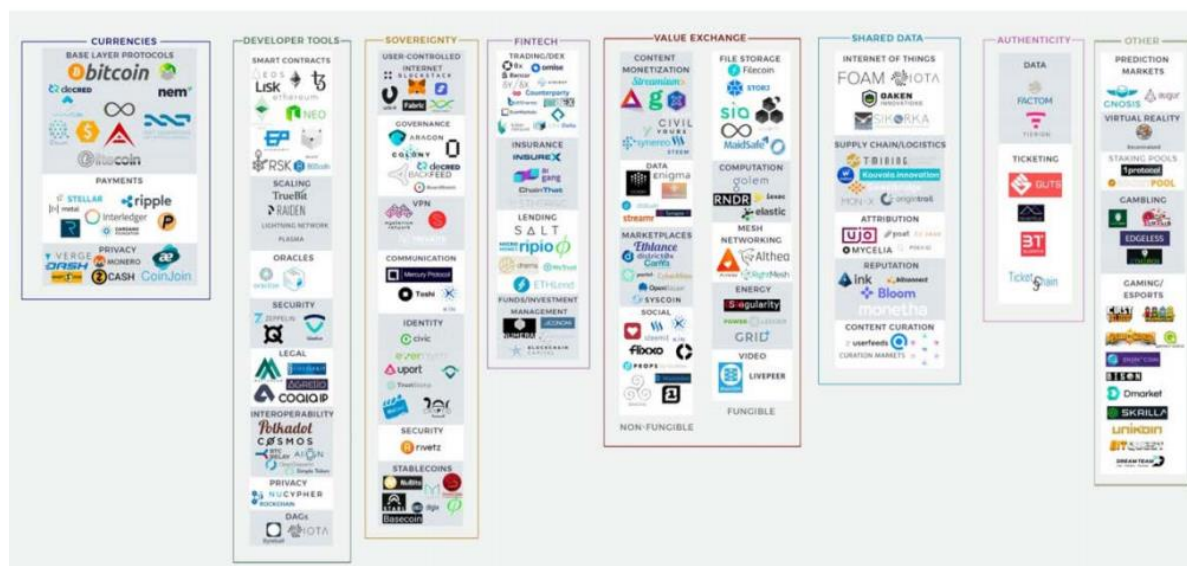
Blockchain and Artificial Intelligence

Blockchain has been identified as having the potential to facilitate certain aspects of the AI implementation. In order to function to its fullest capacity, machines capable of learning require access to big data. The exchange of big data has not been economically feasible but with the aid of the blockchain, this could change. Blockchains can provide a secure environment for big data owners to connect with AI developers. By so doing, complex machine learning algorithms can be developed to help smart devices take advantage of the data available to them in order to achieve artificial sentience.

6. CHALLENGES IN BLOCKCHAIN

Awareness and Understanding	• The principal challenge associated with blockchain is lack of awareness of the technology, especially in sectors other than banking, and a widespread lack of understanding of how it works.
Organisation	• Different chains developed by different organisations to many different standards defeats the purpose of distributed ledgers, fails to harness network effects and can be less efficient than current approaches.
Culture	• A blockchain represents a shift away from the traditional ways of doing things – even for industries that have already seen a significant transformation from digital technologies. • It places trust and authority in a decentralised network rather than in a powerful central institution.
Cost and Efficiency	• The speed and effectiveness with which blockchain networks can execute peer-to-peer transactions comes at a high aggregate cost, which is greater for some types of blockchain than others. • The total running costs associated with validating and sharing transactions on the public ledger are estimated to be as much as \$600.0mn a year and rising, excluding the capital costs associated with acquiring specialist mining hardware.
Regulation and Governance	• Bitcoin blockchain bypasses regulation completely to tackle inefficiencies in conventional intermediated payment network. • Decentralised networks can be much less resilient to shocks, which can impact participants directly, unless careful thought is given to their design.
Security and Privacy	• While cryptocurrencies offer pseudonymity, many potential applications of the blockchain require smart transactions and contracts to be indisputably linked to known identities, thus raising questions about privacy and the security of the data stored and accessible on the shared ledger.

7. COMPETITIVE LANDSCAPE



Source: Credit Suisse ICR

Major Blockchain Companies

Company	Market Cap	Business Description
Ethereum	\$73.0bn	- A decentralised platform that works with smart contracts. Smart contracts allow making agreements that are executed automatically without any human interaction. - In 2017, every three out of four projects were performed on the Ethereum platform, making it the most popular platform for ICO over the year.
Ripple	\$30.0bn	A real-time gross settlement and currency exchange. Its main goal is to make an entire system devoted to money transferring.
IOTA	\$15.0bn	An open-source distributed ledger specialised in the Internet of Things. This system has no transaction fees, low confirmation time and is stable regardless the number of transactions. Up to November 2017, IOTA platform had over 65,000 users.
Qtum	\$5.0bn	First UTXO-based smart contract system with a proof-of-stake consensus model. The platform use Account Attraction Layer to combine Bitcoin Core and Ethereum Virtual Machine.
Coinbase	\$2.0bn	Digital currency wallet and platform for exchange. One of the three blockchain projects that got BitLicense, the business license issued by New York State Department of Financial Services.
OmiseGO	\$1.7bn	OmiseGO is the decentralised financial technology for exchange and payment services. In August 2017, OmiseGO became the first Ethereum-based token with capitalisation over \$1bn.
Augur	\$1.0bn	Prediction market platform for real events. Since the system is Ethereum-based, smart contracts will make sure payments are processed.
Steem	\$850.0mn	The decentralised social publishing network. Publishers monetise their online content and community, based on battle-tested blockchain technology.

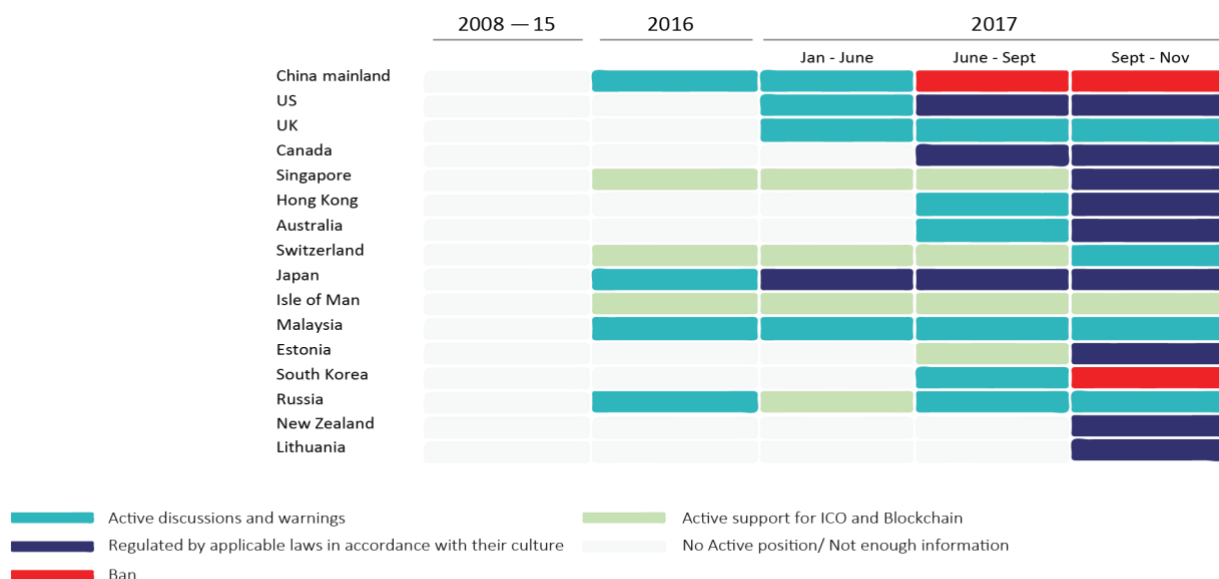
Golem	\$500.0mn	First open-sourced decentralised supercomputer. The network is powered by the users' computers. A number of industries require a lot of computations such as biology, DNA analysis, cryptography, discrete logarithm, machine learning, big data, etc. The service provides the power for them.
Brave	\$340.0mn	A web browser that blocks advertisements and trackers. At a rough estimate, Brave has about 2.0-3.0mn users. Brave is also one of the fastest ICOs. The team raised \$35.0mn in 27 seconds.

Source: Cointelegraph.com
Note: As of Dec, 2017

8. REGULATORY DEVELOPMENTS

Blockchain is a technology used in various sectors for various applications, and not a product or a sector which is governed by a set of rules in itself, there are a few regulatory measures that it needs to overcome to be successfully used in various sectors. These includes legal frameworks like territoriality (issues of jurisdiction and applicable law) and liability should something go wrong. Major regulatory challenges for blockchain is in cryptocurrency world (in which it has a major application), where several countries have issued warnings against them.

Summary of Legal Status



Sources : data from regulators webpages (ASIC, SEC, Bank KHP, SFC, CSA, MAS, Isle of Man's Department of Economic Development, SC of Malaysia)

Various countries have also offered initiatives (by establishing pseudo regulatory authorities) which could be a step towards settling up a regulatory framework for the cryptocurrencies and ICOs, hence promoting the use of blockchain more extensively.

May 2017



Simple Agreement for Future Tokens (SAFT)

The Investment contract between ICO organizer and accredited investor, developed by Protocol Labs. It offers options for the token purchase compatible with US law. The option is valid until the platform is started, then it is exchanged for utility tokens.

August 2017



Russian Association of Blockchain and Cryptocurrency

An association of developers, users and products of blockchain technology that promotes the spread and integration of blockchain into the country economy, and coordinates business activities of association members, as well as protection of their property interests.

September 2017



ICO Code of Conduct

The Crypto Valley Association (Switzerland) initiative to develop an official ICO code that will help to avoid risks and misconduct by ICO organizers.



ICO Governance Foundation (IGF)

An International organization with the purpose of protecting ICO investors and promoting the formation of ICO capital. IGF initiated a voluntary registration form for ICO (Form IGF-1). The foundation cooperates with national regulators (SEC, ESMA, CSRC, MAS) to create methods and standards for ICO regulation that complements existing regulation.



ICO Transparency Initiative

An initiative of 16 blockchain projects aimed at disclosing data on project-controlled wallets and explaining any costs exceeding 0.5% of collected funds.

October – December 2017



Token Alliance

A chamber of Digital Commerce initiative aimed at developing standards for the ICO as well as solving issues related to SEC regulation.



Initiative for ICO Regulation

Waves driven association that will develop standards for reporting, tax and accounting, compliance with "know your client" procedures and various legal and regulatory aspects for the ICO and the blockchain industry.

Source: EY ICR

9. KEY M&A TRANSACTIONS

Enterprise blockchain-focused companies, who design a technology infrastructure and applications for other businesses to use blockchain, are drawing investment and have seen the first M&A deals. Fintech companies, financial institutions, technology companies and regulators have been working on forming a consortium or joint ventures to popularize the technology more quickly. However, a large challenge for M&A could be pricing, as the technology itself and commercial applications are evolving fast and facing uncertainties. Even blockchain entrepreneurs have found it hard to price their own companies, and the landscape will remain difficult until companies have a more sustainable business model with recurring revenue.

Ann.Date	Target Company	Target Description	Target Country	Bidder Company	Bidder Country	EV (EURm)	Deal Des/Rationale
15-Dec-17	Ziddu.com	Blockchain-empowered global Micro-lending Solutions provider	SG	LongFin	US	na	LongFin Corp., a US-based company that offers commodity trading, alternate risk transfer, and carry trade financing services, has agreed to acquire Ziddu.com, a US-based blockchain-empowered global Micro-lending Solutions provider, from Meridian Enterprises Pte.Ltd, for a minimum consideration of USD 13.47m.
6-Dec-17	BitPay	Provider of electronic payment processing solutions	US	Aquiline Capital Partners	US	na	Aquiline Capital Partners, the US-based private equity firm, through its fund Aquiline Technology Growth, has acquired an undisclosed stake in BitPay, Inc., the US-based provider of bitcoin payment processing solutions. The acquisition will give BitPay access to Aquiline's expertise in the financial services industry. BitPay will use the investment to further expand into emerging markets in Asia.
3-Dec-17	BiWang Group	Blockchain mining chip company	CN	CollinStar Holdings	AU	84	CollinStar Holdings, an Australia-based investment organisation dedicated to global blockchain cryptocurrency technology investment and digital asset operations, has agreed to acquire BiWang Group, Ltd. (BWG), a China-based blockchain mining chip company. With this acquisition, CollinStar is placed to capitalize on BWG's technological advantages and existing resources and apply capital power to realign its position to promote the growth of the entire blockchain ecosystem.
7-Nov-17	Coinstream Mining (49.9% Stake)	Cryptocurrency mining company	CA	Global Blockchain Technologies	CA	na	Global Blockchain Technologies Corp. has agreed to acquire a 49.9% stake in Coinstream Mining Corp., a Canada-based cryptocurrency mining company. The transaction is made to fulfill Coinstream's primary goal to provide non-dilutive capital to existing cryptocurrency miners. The transaction will allow Coinstream to expand aggressively with multiple teams in multiple locations, and will thus reduce their risks.
15-Sep-17	Blockchain Technology Group	Information technology company engaged in developing blockchain technology solutions, search and data analytics	CA	Acana Capital	CA	5	Acana Capital Corp, a listed Canada-based company engaged in the acquisition and development of real estate and farming properties has agreed to acquire Blockchain Technology Group Inc, a Canada-based information technology company engaged in developing blockchain technology solutions, search and data analytics, via a reverse takeover transaction.
15-Jun-17	Genesis Mining (Blockchain Data Center)	GPU-based blockchain data Center	IS	HIVE Blockchain Technologies	CA	22	Leeta Gold Corp, a Canada-based listed blockchain mining company has agreed to acquire Genesis Mining Ltd. is a Hong Kong- based cryptocurrency mining company. The transaction will form a strategic partnership between Leeta Gold and Genesis. The transaction involves an agreement of governing potential acquisition of other cryptocurrency data centers from Genesis.
23-May-17	R3 CEV	Engaged in designing and delivering advanced distributed ledger technologies	US	Consortium of investors	UK,JP,SG, US	na	A consortium of investors led by SBI Group, Bank of America Merrill Lynch, HSBC, Intel & Temasek has agreed to acquire R3 CEV, LLC, the US-based company engaged in designing and delivering advanced distributed ledger technologies. The transaction is a part of R3's series A fundraising round, out of which they have completed the first two out of the three tranches.
6-Jan-17	BTCC Technology	Providing trading platform for bitcoins	CN,HK	Shanghai Mingjia Investment Management Co	CN	na	Shanghai Mingjia Investment Management Co., Ltd., a China-based holding company having interest in companies engaged in providing trading platform for bitcoins, has agreed to acquire BTCC Technology Limited, a China-based company providing trading platform for bitcoins, from Lightspeed Venture Partners and Blockchain Capital

Source: Merger Market

10. RECENT DEVELOPMENTS

- **Growing Acceptance of Blockchain Technology:** In January 2018, Vanguard tested and planned to go live with a blockchain-based system that will automate the sharing of index data with one of its top benchmark providers. Additionally, Broadridge, J.P. Morgan, CME Group, State Street and others have joined the Hyperledger Project, an open-source project aimed at driving the adoption and standardisation of DLT.
- **Singapore Airlines Moved Its Frequent Flyer Programme to the Blockchain:** In February 2018, the KrisFlyer digital app allowed frequent flyers to spend their digital miles at participating retailers.
- **FedEx Moves on to the Next Stage of Blockchain Development:** In February 2018, FedEx completed its initial trial of proof of concepts in an effort to utilise blockchain for invoicing and address information.

- **Wien Energie to Introduce Blockchain-based Energy Products:** In February 2018, Wien Energie announced that it is currently testing blockchain-based services and intends to introduce related products later this year.
- **Blockchain-based Telemedicine Platform WELL Launches ICO:** In February, 2018, WELL, a global platform which connects doctors to patients using advanced payment technologies of blockchain, launched an ICO.
- **Blockchain Start up Raises \$61.0mn from Andreessen Horowitz, U.S. Hedge Fund:** In February 2018, DFINITY, a Blockchain based start up raised \$61.0mn from a group of investors that includes venture capital giant Andreessen Horowitz and token hedge fund Polychain Capital.
- **Canada – Regulators Approve Country’s First Blockchain ETF:** In February 2018, Harvest Portfolios received approval to issue Canada’s first ever blockchain-based Exchange Traded Fund (ETF). The fund (ticker symbol HBLK) is set to begin trading on the Toronto Stock Exchange next week, is focused on large and small-scale blockchain corporations.
- **Warren Buffet's Railroad Firm Joins Blockchain Alliance:** In February 2018, BNSF Railway, a major US freight railroad network owned by Warren Buffet's Berkshire Hathaway, became the latest member of the Blockchain in Transport Alliance (BiTA).
- **Ripple Blockchain Network Adds China Payments Provider:** In February 2018, a Chinese payment provider LianLian joined RippleNet, the payment network that uses Ripple’s blockchain technology to facilitate cross-border transactions.
- **Startup Raises \$20.0mn to Build ‘YouTube on the Blockchain’:** In February 2018, LINO tokens will operate as the system’s currency and will be earned by creating and sharing content, as well as from the development of infrastructure and applications on top of the Lino Blockchain. Silicon Valley startup Lino is preparing to take on YouTube with a decentralised, collectively owned video content distribution system that purports to cut out the middleman to more fairly compensate content creators.
- **Etherty Announces Pre-ICO for Blockchain-based Real Estate Services:** With their pre-ICO sale starting on 1 February 2018, the Etherty platform is coined to be a game changer. By utilising blockchain technology and smart contracts, Etherty users will be able to easily and efficiently buy, sell and crowdfund real estate globally.
- **Agility Joins Maersk-IBM Blockchain Community:** Agility has become the first freight forwarder to collaborate on Maersk and IBM’s blockchain solution, which aims to provide more efficient and secure methods for conducting global trade.

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ABOUT Global M&A Partners

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Global M&A Partners will soon open an office in Zug, Switzerland. Zug has established itself as a globally leading hub for blockchain technology.



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