

A guide to cryptocurrencies

Widely hailed as the future of money, cryptocurrencies have had a wild ride over the past one year, currently standing at a combined value of about US\$2.4 trillion*. **The Straits Times** takes a look at how they work.

HOW CRYPTOCURRENCY AND BLOCKCHAIN WORKS

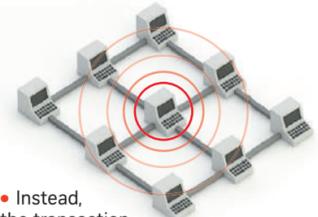
A cryptocurrency is virtual money that allows for online transactions without the need for notes or coins. These currencies typically operate in decentralised systems that record transactions in distributed ledgers called blockchains, which are secured through cryptography.

Submitting a payment

- Tommy wishes to pay Billy in Bitcoin.
- Tommy's transaction is signed with a private key, a combination of letters and numbers unique to his Bitcoin wallet.



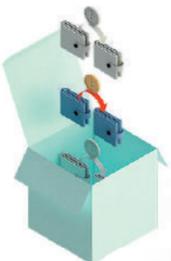
- The transaction in this case does not involve any banks or middlemen.



- Instead, the transaction is broadcast to the whole Bitcoin network.

Verifying the transaction

- Miners on the Bitcoin network bundle this transaction with other recent transactions into a block.



- To verify the block, these miners race to solve a difficult maths puzzle.

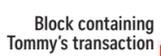


- The first miner to solve the puzzle will have his record of the block become official.
- He is then rewarded with bitcoins and the network gets his block added on the blockchain.



Transaction verified

- As time goes on, the block containing Tommy's transaction gets buried beneath other more recent blocks on the chain.
- If anyone wants to tamper with Tommy's transaction, he would have to redo the work of that block's miner and all the subsequent miners.



TOP 10 CRYPTOCURRENCIES BY MARKET VALUE

1

Bitcoin (BTC)

Bitcoin and blockchain were first outlined in a 2008 paper by a person or group calling themselves Satoshi Nakamoto, whose real identity remains unknown. Bitcoin is the most successful cryptocurrency and it has spawned a slew of imitators. It remains the most valuable cryptocurrency by market capitalisation, a position it has held for more than 10 years.

- Circulation:** Since 2009
- Total value:** **US\$1,117 billion*** based on unit price of **US\$59,206.52**

2

Ethereum (ETH)

This is a decentralised software platform that allows smart contracts and decentralised apps to be developed and run without any downtime, fraud, control, or third-party intervention. Ether is the native cryptocurrency of the platform.

- Circulation:** Since 2015
- Total value:** **US\$449 billion** **US\$3,804.59/unit**

3

Binance Coin (BNB)

This is the cryptocurrency issued by the Binance exchange, which is one of the world's most popular exchanges in terms of trading volume.

- Circulation:** Since 2017
- Total value:** **US\$79 billion** **US\$466.26/unit**

4

Cardano (ADA)

Cardano is a blockchain platform which has positioned itself as an alternative to Ethereum. ADA is the internal cryptocurrency of the platform.

- Circulation:** Since 2017
- Total value:** **US\$72 billion** **US\$2.20/unit**



5

Tether (USDT)

This is a stablecoin, a class of cryptocurrencies that attempts to offer price stability and is pegged to a currency or other external reference points.

- Circulation:** Since 2015
- Total value:** **US\$69 billion** and indexed to the US dollar

6

XRP (XRP)

Ripple is the company that is behind XRP, the cryptocurrency. Many major banks use the XRP payment system.

- Circulation:** Since 2013
- Total value:** **US\$54 billion** **US\$1.14/unit**

7

Solana (SOL)

This is often referred to as an "Ethereum killer".

- Circulation:** Since 2020
- Total value:** **US\$49 billion** **US\$161.58/unit**

8

Polkadot (DOT)

This is another cryptocurrency that is often said to be an "Ethereum killer".

- Circulation:** Since 2020
- Total value:** **US\$40 billion** **US\$40.76/unit**

9

USD Coin (USDC)

This is another stablecoin. One USDC token is always valued at exactly US\$1.

- Circulation:** Since 2018
- Total value:** **US\$33 billion** **US\$1/unit**

10

Dogecoin (Doge)

Dogecoin was created as a light-hearted alternative to traditional cryptocurrencies. It features a popular Shiba Inu meme.

- Circulation:** Since 2013
- Total value:** **US\$30 billion** **US\$0.23/unit**

A HISTORY OF CURRENCIES

Around 9,000BC

Barter
Cattle, other livestock bartered as a form of currency



1,000BC

Metal coins
Metal versions of cowry shells from China considered earliest types of coins



600BC

Gold and silver coins
First national currency in modern-day Turkey



Around AD800

Paper money
First versions of paper money printed in China. Banknotes in Europe are introduced in the 17th century



1400

Banks
Concepts of banking, commercialised debt emerge



1816

Gold Standard
Officially made standard of value in England. Adopted in the US in 1900



1930s

End of Gold Standard
In the US, the standard is revised and gold is devalued. British and international gold standards also end



1950

Credit card
Diner's Club issues credit cards that can be used at multiple locations



End-1990s

Digital payments
Payments via portable electronic devices begin



2009

Virtual currency
Bitcoin is launched as a cryptocurrency (decentralised). Others follow (like Ethereum, Litecoin, etc)



April 14, 2021

Cryptocurrency trading at Wall Street
Coinbase, first company devoted entirely to cryptocurrency, enters US stock exchange



Sept 7, 2021

Bitcoin becomes legal tender
El Salvador becomes first country in the world to accept Bitcoin as legal tender



ENVIRONMENTAL IMPACT

- Because of the power-hungry computations required for mining, many cryptocurrencies consume enormous quantities of electricity.
- The annual energy usage of Bitcoin currently rivals that of some small countries.
- The carbon dioxide emission of Bitcoin is now greater than that of Greece.

Bitcoin energy consumption compared to some countries



US\$1 billion in Bitcoin purchases is equal to the carbon dioxide emissions of

632,000 homes' energy use for one year



1.4 Coal-fired power plants per year



12.7 million barrels of oil consumed



1.2 million cars driven in one year



CRYPTOCURRENCY REGULATIONS AROUND THE WORLD

United States

- Despite having a high number of cryptocurrency investors and blockchain companies, the US has yet to create a clear regulatory framework for the asset class.

European Union

- Cryptocurrency is legal throughout most of the EU, although exchange governance depends on individual member states.

China

- China's central bank said all cryptocurrency-related transactions are illegal and must be banned.

Singapore

- Cryptocurrency classified as property but not legal tender.
- Digital payment token licences granted to local fintech firm Fomo Pay, DBS Vickers and Australian crypto exchange Independent Reserve.

