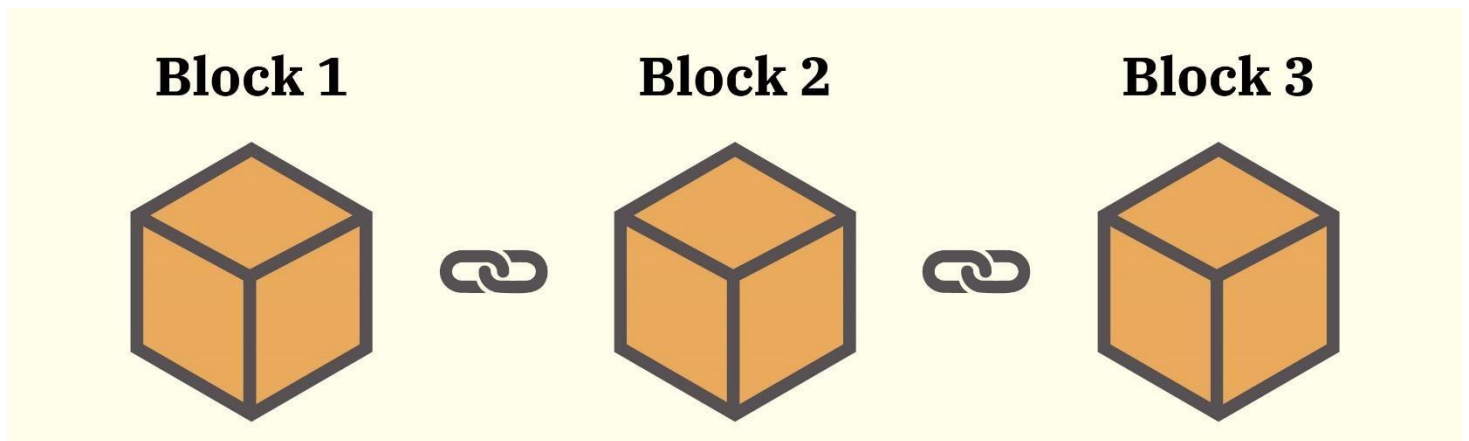


Blockchain

By Vikas, 2nd year BCA – C section
U05BA22S0154



Decoding the Basics

You may have come across terms like Bitcoin and Ethereum, but what exactly are they? These are digital currencies using a technology called blockchain, which is like a digital ledger, ensuring transparency and security of transactions, just like our regular Indian Rupee, changing the hands.

Understanding Blockchain

So, what is a blockchain?

It's not just a chain of blocks; it's a global digital ledger recording transactions initiated by users. These transactions, or the transfer of digital currency, are verified and combined into an immutable (*which can't be modified*) blocks. These blocks, continuously added in sequence, form the unbreakable chain, we call a blockchain.

There are various blockchains like Bitcoin, Ethereum, Polygon, Solana, Arbitrum, Binance... each with its unique way of storing and verifying transactions.

The story behind blockchain



This is where it gets interesting,

In 2008, the whole world was in a bit of a money mess. Traditional banks weren't doing so well, and people were looking for new ways to handle their money without relying on centralized entities like banks.

That's when a mysterious person named Satoshi Nakamoto came up with a brilliant idea: blockchain.

Satoshi Nakamoto had a clear goal — to make a system where no one person or big company controlled everything. He wanted a system that will change, the way we use and handle money.

In October 2008,

Nakamoto shared the plan of blockchain in, what we call the Bitcoin paper (*a paper or pdf which contains how blockchain will work*). It talked about making a cash system where regular people could exchange money directly with each other in a decentralized way (*where no single entity or person controls everything*). The problems with regular banks pushed Nakamoto to suggest a fix that didn't need middlemen.

So, imagine a world where everyone can trade money without a big bank overseeing everything. That was Nakamoto's dream, and blockchain was the tool to make it happen. But implementing it wasn't an easy task!

The birth of Blockchain



In January 2009, Nakamoto mined (*created*) the first block of the Bitcoin blockchain, known as the "genesis block". This marked the birth of the first cryptocurrency, Bitcoin, and the foundational block of what we now know as blockchain technology.

The creation of the genesis block also contained a message embedded in its code: "The Times 03/Jan/2009 Chancellor on brink of second bailout for banks." (*The headline of 'The Times' newspaper on Jan 3*) It was a clear statement about the motive behind Bitcoin's creation — a response to the flaws in the traditional financial system.

As Bitcoin gained attraction, it became evident that blockchain technology extended beyond a mere digital currency. Blockchain offered a decentralized, transparent, and secure method for recording transactions — Blockchain changed how money works, and it's not just about money—it transformed many other things too, going way beyond just banks.

Challenges for Blockchain

The early years of blockchain were not without challenges. Scalability (*handling large number of users*) and transactions speed emerged as significant roadblocks. Bitcoin's original proof of-work (*a mechanism used to prove that a transaction is valid, which consumes lot of energy*) consensus mechanism faced criticism for its energy-intensive mining process. Additionally, the association of cryptocurrencies with illegal activities raised regulatory concerns.

However, the blockchain community responded with resilience and innovation. Alternative consensus mechanisms, such as proof-of-stake and delegated proof-of-stake, were introduced to address scalability and energy consumption issues. Regulatory bodies started to take shape, acknowledging the potential benefits of blockchain technology while addressing concerns about misuse.

How Blockchains work?

When a user submits a transaction (*which includes fees to pay for transactions*) and all the set of transactions created by users are stored in what is called a mempool (*a storage of transactions*), the miners (*users who run computers to create proof and verify the transactions*) pick the transactions from mempool and combine it to make a block and add to blockchain for a reward (*a part of transaction fees paid by users*).

Here there will be multiple miners, who will try to solve a mathematical problem and create proof and add it to blockchain for rewards, here the miner who first creates a valid proof (*proof of transactions created by the miner, which are verified by other miners*), gets a chance to add block to the blockchain, if 51% of total miners accept that the proof is valid.

This is how it is decentralised and not in control of no single entity, even if a single entity tries to control blockchain, it needs to have control over 51% of total miners in the network, which is nearly impossible.

Wrap up

Now, let's wrap up and explore who uses blockchain.

Many industry leaders, including **IBM, Microsoft, JPMorgan Chase, Walmart, Visa, Samsung, Maersk, Amazon, Accenture, Intel, Nestle**, and numerous other top companies, integrate blockchain into their everyday operations.

Ready to be part of the blockchain revolution? Learn more at [Ethereum.org](https://ethereum.org)