



# Department of Computer Engineering

Government Polytechnic for Girls, Surat

May-2020 : Vol.- 8

## TechTrends

E-Newsletter



### Vision:

To empower girls of diploma computer engineering to excel in IT Industries and serve the society.

### Mission:

- To strive for academic excellence and professional competence among students and staff.
- To encourage innovative ideas among students to enhance their entrepreneurship skills.
- To provide high tech educational resources and supportive infrastructure.

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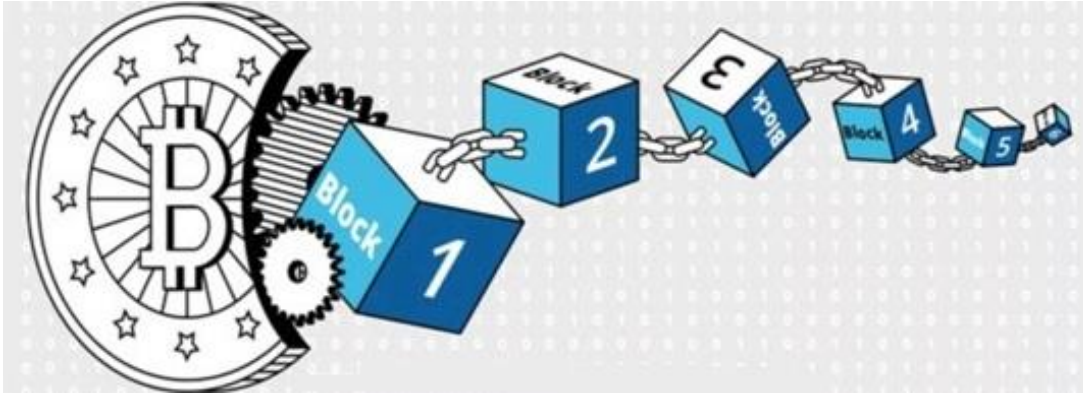
# Blockchain

## Introduction

Blockchain means chain of blocks. Block can be seen as record/data and Growing list of records & connecting all the blocks is simply a blockchain. Each block can be uniquely identify because each block has a cryptographic hash code of the previous block. More over the block also contain transaction data & timestamp. So basically A Blockchain is a diary that is almost impossible to fake/modify.

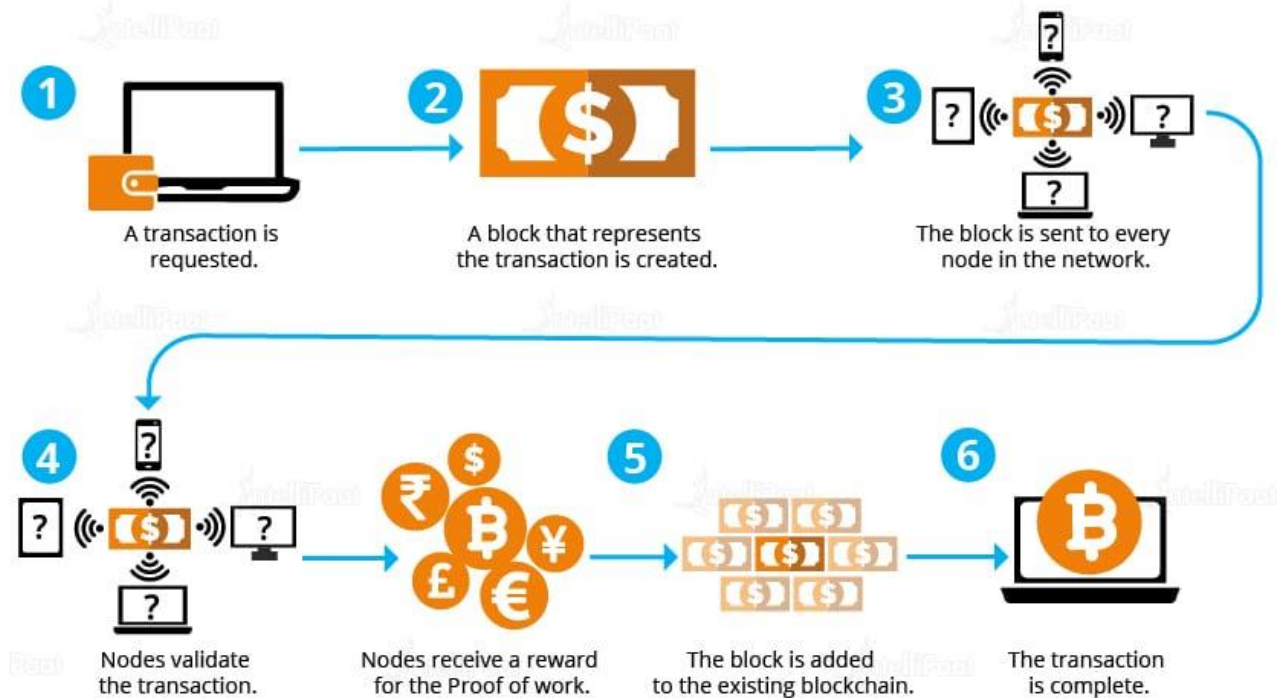


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## How it works?

### How Do Blockchains Work?



[1]

When a block stores new data it is added to the blockchain. Blockchain, as its name suggests, consists of multiple blocks strung together. In order for a block to be added to the blockchain, however, four things must happen:

1. A transaction must occur. Let's continue with the example of your impulsive Amazon purchase. After hastily clicking through multiple checkout prompt, you go against your better judgment and make a purchase. As we discussed above, in many cases a block will group together potentially thousands of transactions, so your Amazon purchase will be packaged in the block along with other users' transaction information as well.
2. That transaction must be verified. After making that purchase, your transaction must be verified. With other public records of information, like the Securities Exchange Commission, Wikipedia, or your local library, there's someone in charge of vetting new data entries. With blockchain, however, that job is left up to a network of computers. When you make your purchase from Amazon, that network of computers rushes to check that your transaction happened in the way you said it did. That is, they confirm the details of

the purchase, including the transaction's time, dollar amount, and participants. (More on how this happens in a second.)

3. That transaction must be stored in a block. After your transaction has been verified as accurate, it gets the green light. The transaction's dollar amount, your digital signature, and Amazon's digital signature are all stored in a block. There, the transaction will likely join hundreds, or thousands, of others like it.
4. That block must be given a hash. Not unlike an angel earning its wings, once all of a block's transactions have been verified, it must be given a unique, identifying code called a hash. The block is also given the hash of the most recent block added to the blockchain. Once hashed, the block can be added to the blockchain. [2]

When that new block is added to the blockchain, it becomes publicly available for anyone to view.

## Is blockchain Secure?

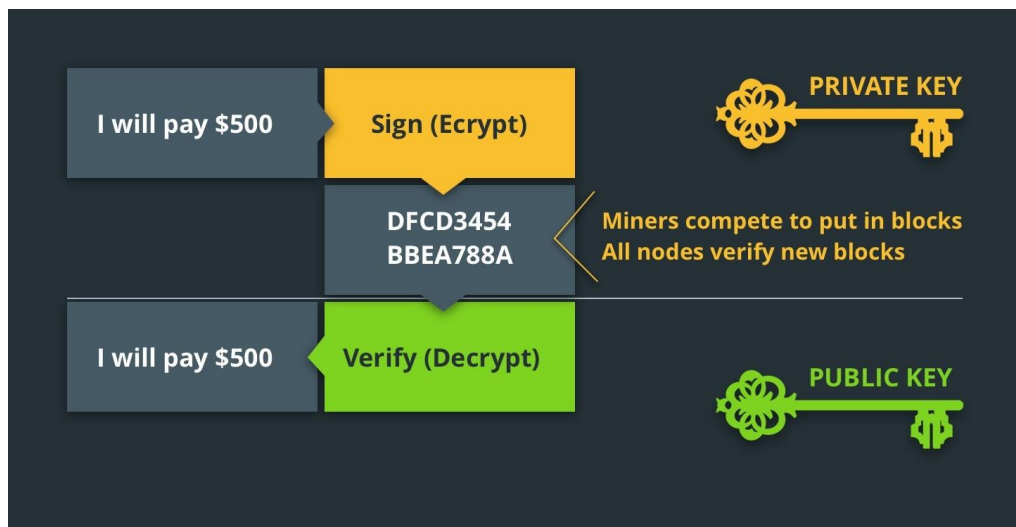
After a block has been added to the end of the blockchain, it is very difficult to go back and alter the contents of the block. That's because each block contains its own hash, along with the hash of the block before it. Hash codes are created by a math function that turns digital information into a string of numbers and letters. If that information is edited in any way, the hash code changes as well. Let's take an example, say a hacker attempts to edit your transaction from Flipkart, so that you actually have to pay for your purchase twice. As soon as the hacker edit the rupees amount of your transaction, the block's hash will change. The next block in the chain will still contain the old hash, and the hacker would need to update that block in order to cover their tracks. However, doing so would change that block's hash. And the next, and so on.

## How Transaction is made?

To carry out a transaction you need two things: a wallet, which is basically an address, and a private key. The private key is a string of random numbers, but unlike the address the private key must be kept secret.

When someone decides to send coins to anyone else they must sign the message containing the transaction with their private key. The system of two keys is at the heart of encryption and cryptography, and its use long predates the existence of Blockchain. It was first proposed in the 1970s.

Once the message is sent it is broadcast to the Blockchain network. The network of nodes then works on the message to make sure that the transaction it contains is valid. If it confirms the validity, the transaction is placed in a block and after that no information about it can be changed. [2]



## Advantages & Limitations

Pros	Cons
<ul style="list-style-type: none"> <li>Highly accurate, because no human involvement in verification</li> </ul>	<ul style="list-style-type: none"> <li>High technology cost</li> </ul>
<ul style="list-style-type: none"> <li>No Third-party verification cost can</li> </ul>	<ul style="list-style-type: none"> <li>Slow rate of Transactions</li> </ul>
<ul style="list-style-type: none"> <li>Tempering data is almost impossible because of Decentralization</li> </ul>	<ul style="list-style-type: none"> <li>Possibility of application in illegal activities</li> </ul>
<ul style="list-style-type: none"> <li>Secure and efficient Transactions</li> </ul>	
<ul style="list-style-type: none"> <li>Transparent</li> </ul>	

## Applications of Blockchain

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Crypto currency</li> <li>2. Digital identity &amp; its verification</li> <li>3. Internet of things (IoT)</li> <li>4. Insurance claims</li> <li>5. Product warranty claims</li> <li>6. Social media</li> <li>7. Protection against Criminal activity</li> </ol> | <ol style="list-style-type: none"> <li>8. Intellectual property safety</li> <li>9. Stock market</li> <li>10. Banking sector</li> <li>11. Healthcare domain</li> <li>12. Election</li> <li>13. Supply chain management</li> </ol> |
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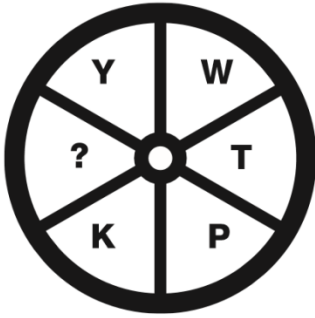
## References

- [1] <https://intellipaat.com/blog/tutorial/blockchain-tutorial/how-does-blockchain-work/>
- [2] <https://www.investopedia.com/terms/b/blockchain.asp>
- [3] <https://cointelegraph.com/bitcoin-for-beginners/how-blockchain-technology-works-guide-for-beginners>



## QUIZ (8)

Q-1 which letter replaces the question mark to complete this circle?



Options

- (A) D
- (B) F
- (C) E
- (D) G

### Answer of Last Quiz (7)

1. D      2. A      3. B

### Student Corner:

## Just Like the Weather

*Life can be good*

*Life can be bad*

*Just Like the Weather*

*You never know*

*What's to be had*

*Seasons of joy*

*Seasons of sorrow*

*Just Like the Weather*

*There's always tomorrow*

*Months turn to years*

*Years to a lifetime*

*Just Like the Weather*

*It stays on our mind*

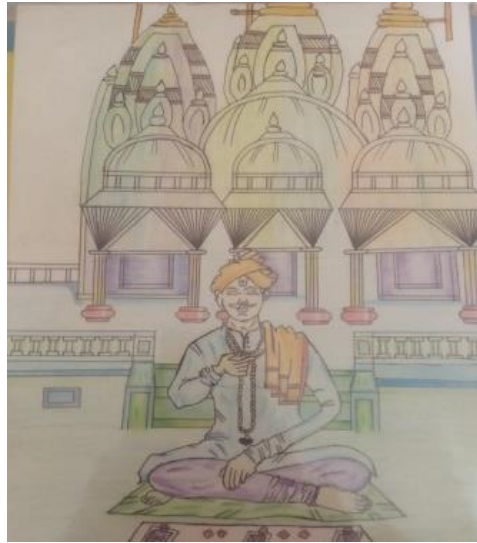


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