

A Survey of Block Chain Technology and its Applications

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ABSTRACT

Blockchain is an emerging technology of the future. A wide range of transactions and applications uses the blockchain. Cryptocurrency and bitcoin applications were used to start of the block chain concept that was used for a secure and reliable network. Amalgam of different tools and methods like cryptography, mathematics, and networking is the Block chain technology. This paper enlightens the varied types of Blockchain algorithms. An insight of the real time applications of Blockchain in the recent era is discussed.

keyword: Blockchain, Types of block chain, Applications

1. INTRODUCTION

Satoshi Nakamoto invented the Block Chain technology. The information documented in Blockchain has a high degree of security. It is extremely hard to alter, manifest the data. A Block Chain is a digital ledger of transactions that are replicated and spread over the entire network of systems. All the operations are distributed over the network in the Block chain. A solid central Authority is not the need of the hour to monitor the transactions. Instead Block chain uses the Bitcoins and Cryptocurrencies over the network to complete the transactions by reducing the threat of hacking as well as the cost incurred for the transaction process.

Basically Block Chain is storing the information as a chain of blocks as in fig1. The Type of Block chain used decides the way in which the data is stored within a block. Genesis is the name of the first block in the Block Chain. Various MNC's like Amazon, Microsoft, Samsung, Alibaba, Walmart operate with live Block chain. Ethereum is the widely used block chain. Due to the increased fee for transactions and least scalability, it also faces a negative impact. [1].

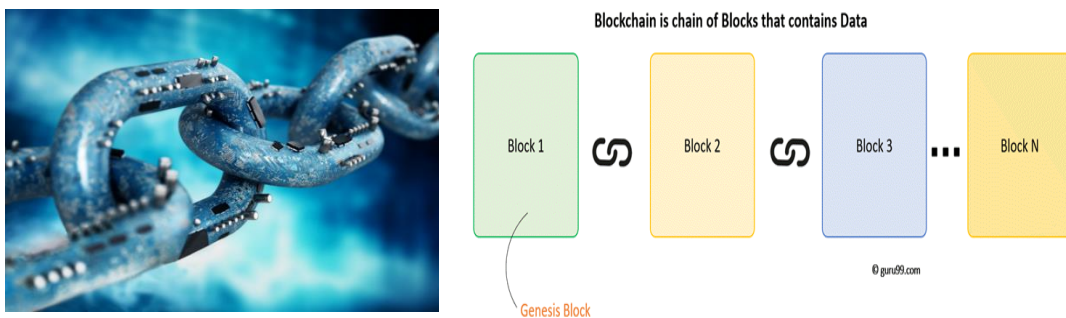


Fig 1: View of Block Chain Model

2. TYPES OF BLOCKCHAIN

Private and Public Block chains are the basic types of blockchain. In addition to these, Consortium, Hybrid Block Chains are also available. On Peer-to-Peer network (P2P), each block Chain consists of a group of nodes. On a timely basis, the individual node in the network is updated based on the data of the shared ledger. Every node has the ability to start the

transactions, check and receive the transactions. They also have the rights to create the blocks [2]. The different types of Block Chains are discussed in detail.

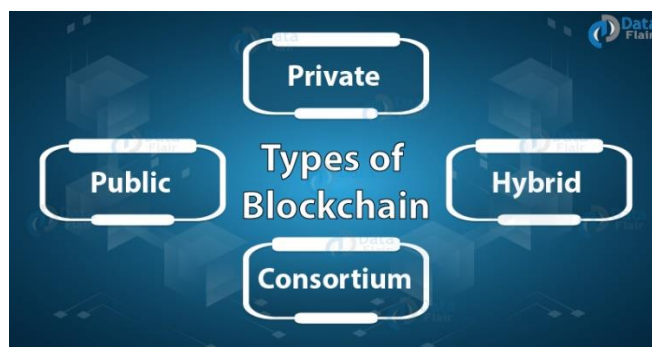


Fig 2: Types of Block Chain

2.1 Public Blockchain

The Public Block Chain is an open and decentralised distributed ledger system. The users of the internet can also access the block chain system with proper authentication and becomes a part of the block chain network. They are allowed to access the records either past or present, authorising the transactions. Public block chains are widely used for mining for the interchange of the cryptocurrency. Bitcoin, Litecoin, Ethereum are the widely used Public Block Chains. When the security rules and regulations are followed strictly the Public Block Chain is the most trusted Block Chain of the network.[03]

2.2 Private Blockchain

A Private block chain is operated in a closed network that requires permission for operation. It is mostly used within a group, organization that restricts the number of participants accessing the network. Centralised authority controls the authentication as well as checks the security disputes. Private block chains resemble the public only within a limited network. This type of block chain helps in the voting process, digital identity, supply chain management [4].

2.3 Consortium Blockchain

Semi-decentralized kind of network is the consortium block chain. One or more organizations are involved in managing the chain of network whereas in a private one, only a centralized organization takes care of the network. These organizations are the nodes that helps in the transaction processing or in performing the mining activity. Government sectors and Banking sectors normally use a Consortium Block chain[5].

2.4 Hybrid Blockchain

Amalgam of Public and Private Block Chain the Hybrid Block Chain. Both the features of public and private block chain are possible in a Hybrid network. In such a scenario, the users of the network control the data residing in the block chain. A Portion of the record or information is made public without permission whereas the rest are available in the private block chain network. The users of the Hybrid Block chain have the choice of connecting to a private block chain with different public block chains. All the transactions are authorised with the private network of the Hybrid Block chain. In some cases, it can also be verified in the public network. This increases the hashing process and higher number of nodes are involved in the authorization thereby improving the security of the block chain. Dragon chain is the most widely used hybrid network [6].

3. CURRENT AND FUTURE USES OF BLOCK CHAIN TECHNOLOGY

Apart from the digital currency, Block Chain is considered as the next generation technology. The digital Currency is the first application of Block Chain, but there are even bigger opportunity than Bitcoin. A trust less transactional process is operated on block chain architecture. It lacks third party and the clearing house of identity information. The Bitcoin, Block Chain are better than the digital currency. Block chain is considered to be 'the next internet'. It is the technology that operates on a decentralized model that doesn't require any human interaction or organization. There is only a trust less interaction among the people [7].

4. APPLICATIONS OF BLOCKCHAIN TECCHNOLOGY

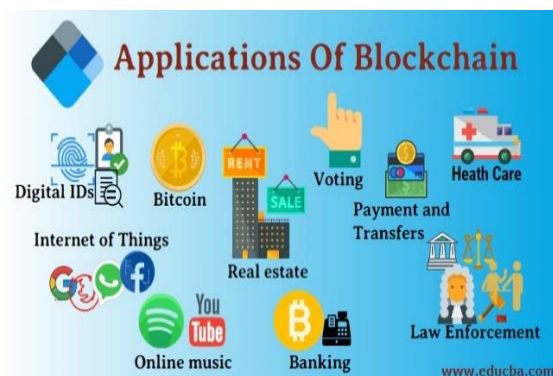


Fig 3: Applications of Block Chain

4.1 Money Transfer

Block Chain is most popular in financial organizations. The usage of bitcoins, cryptocurrency makes the Block Chain a pioneer in the business world. It eliminates the third party transaction fees and also improves the transfer of money much efficiently.

4.2 Financial Exchanges

Quite a number of organizations have shifted towards the block chain technology. They offer a decentralized cryptocurrency for the exchanges. Thus making the transaction much faster and cost effective. In a decentralized type of exchange, the investor does not deposit any asset to the centralized authority there by making the transactions even more secure.

4.3 Lenders

Smart contracts are used by the Lenders to implement the collateralized loans. Services like repayment, service payment, margin call, collateral release are automatically triggered using the smart contracts. This makes the loan processing much faster at a low transaction cost

4.4 Insurance

Smart contracts over a block chain have a huge impact on the insurance customers. All the claims are recorded on the block chain and this helps in reducing the duplication of the claims again and again. The claimants also receive the payments quickly as the smart contract help in speedy process.

4.5 Securely Share Medical Information

When the medical information is available on a block chain, it helps the doctors to fetch the appropriate information about their patients. It also helps the patients who are seeking multiple doctors. The medical records can be accessed at any point of time for improving the treatment in case of any emergency also. The insurance related data are also stored that facilitates the doctors to check for their patient's treatment and insurance cover.

4.6 Voting

When the identity of any individual person is also available on block chain, it helps to great extent in the voting process. Block Chain helps in monitoring the voting process and voids the duplicate entry of votes. The eligible voters can only vote and the votes are not tampered. This process also reduces the cost incurred in the election process.

4.7 Data Storage

Storing the data in a block chain would offer a good security and add integrity. Erasing or altering the data in a network would be very difficult when the data is stored in a decentralized fashion compared to the data that is stored in a centralized way that have redundant copies of the data. Cost incurred in storing the data using block chain is also very minimal.

5. BLOCK CHAIN ADAPTATION AND APPLICATION

Nowadays many business domains switch over to the block chain network as it is transparent as well as decentralized. It also ensures efficient and secure transactions to happen. Many industries that use a middle man shift to blockchain approach. The centralized system of working is transformed to a decentralized approach. Applications like banking, payments make the people around the world feel the comfort of reliable and easy transactions. Many industries also transform to the block chain technology because of the decentralised pattern. It is wide spreadly used in supply chain management, forecasting, IoT and also in the health care industry. All the transactions are easily recorded and monitored in a hazel free mode. Even the charity organizations use the block chain to distribute the aids and monitor the same. The Internet of Things usually requires a conventional set of devices that have to be controlled and operated in a central location. By using the Block Chain in IoT, this approach is changed in a distributed manner. Each of the devices communicates directly with the other devices.

6. CONCLUSION

Block Chain technology is the future technology. It is used widely in most of the government sectors, business organizations and charity groups. Block chain was initially used for the digital currency that later extended its feathers. It is trending technology that could change the current pattern of money transactions and property transactions. In this paper, a survey of various types of block chain was discussed. The applications that use the block chain technology were also enlightened in a birds view. It is observed that the block chain technology is widely used in various domains shifting from a centralized to a decentralized network with high secure and low cost transactions to occur with minimal time interval.

REFERENCES

- [1].F Antonucci, S Figorilli, C Costa, "A Review on blockchain applications in the agri-food sector", Journal of the Science of Food and Agriculture, 2019, Wiley Online Library.
- [2].D Dujak, D Sajter, "Blockchain Applications in Supply Chain", Springer 2018, SMART Supply Network pp 21–46.
- [3].J AbouJaoude, RG Saade, "Blockchain Applications–Usage in Different Domains", IEEE Access 2019, PP(99):45360-45381
- [4].Thomas McGhin, Kim-Kwang Raymond Choo, C. Liu, D. He, "Blockchain in healthcare applications: Research challenges and opportunities", J. Netw. Comput. Appl., 2019
- [5]. C Catalini, JS Gans, "Some simple economics of the blockchain", Communications of the ACM Volume 63, Issue 7, July 2020, pp 80–90, <https://doi.org/10.1145/3359552>.

- [6]. D Yaga, P Mell, N Roby, K Scarfone ,”Blockchain Technology Overview”,
<https://doi.org/10.48550/arXiv.1906.11078>
- [7]. Xuemin (Sherman) Shen, Xiaodong Lin, Kuan Zhang,”Encyclopedia of Wireless Networks”,2020 Springer.
- [8]. QihengZhou , Huawei Huang , Zibin Zheng And Jing Bian ,” Solutions to Scalability of Blockchain: A Survey”,IEEE Access 2020
- [9].Xiwei Xu,Ingo Weber,Mark Staples,” Architecture for BlockchainApplications”,Springer.
- [10]. TA Syed, A Alzahrani, S Jan, MS Siddiqui,”AComparative Analysis Of Blockchain Architecture And Its Applications: Problems And Recommendations”, IEEE Access 2019 ieeexplore.ieee.org.
- [11]. Damiano Di Francesco Maesa, Paolo Mori,” Blockchain 3.0 applications survey”,Journal of Parallel and Distributed Computing, Elsevier 2020.
- [12]. Lu,Yang,”Theblockchain: State-of-the-art and research challenges”,
Journal of Industrial Information Integration, Elsevier Volume 15, September 2019, Pages 80-90
- [13]. Sana Sabah Sabry, Nada Mahdi Kaittan, IsraaMajeed,”The Road To The BlockchainTechnology:Concepts and types”,Periodicals of Engineering and Natural Sciences, Vol 7, No 4 (2019) .
- [14]. I Priyadarshini ,”Introduction To Blockchain Technology”,Cyber security in parallel and distributed 2019,Wiley Online Library.
- [15]. H Sheth, J Dattani ,”Overview Of Blockchain Technology”,Asian Journal For Convergence In Technology 2019 - asianssr.org