

# Survey on Blockchain Technology - Merits, Demerits and Its Applications

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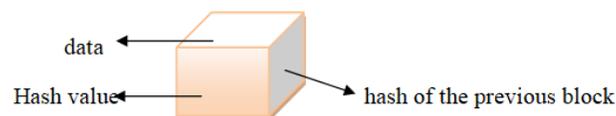
**Abstract-**Blockchain is a growing technology, It is linked to cryptography and it has a list of records called blocks. Block is a digital information and public database is a chain. Blockchain can be distributed recorded but not edited. It is devised of digital currency, bitcoin. It carries no transaction cost only infrastructure cost. Passing information from one node to another by fully automated and safe manner. It creates unique record with unique history. Falsifying any single piece of data means falsifying entire chain. Blockchain helps to authenticate digital information. Three pillars of blockchain technology are decentralization, transparency, Immutability. It is time stamped series of records of data that is managed by cluster of computer it has no central authority. This paper discusses on real time applications, merits and demerits.

**Keywords:** Blockchain, Bitcoins, Cryptocurrency, Cryptography, Records.

## 1. INTRODUCTION

Blockchain is a increasing catalog of proceedings, called blocks, that are associated using cryptography. Every block will have a hash value of current block, cryptographic hash of the previous block, a timestamp, and transaction data. The Blockchain technology will assure us the brilliant future. It can facilitate to create the trade, supervision and logistic systems very persistent, accurate and secure. The definition of the Blockchain technology "The blockchain is an imperishable digital record of financial business to be able to be planned to acknowledgment rebuff currently economic dealings however practically the whole thing of value" – this declaration is one of the mainly well-liked sharpness of the Blockchain, which is urbanized by Don and Alex Tapscott [1].

Blockchain was made-up by a person some populace by means of the person's name Satoshi Nakamoto in 2008 to provide seeing that the community deal ledger of the crypto prevalence bitcoin. The discovery of the blockchain used for bitcoin prepared it the initial digital coinage to resolve the double-spending setback devoid of the required trusted influence. The bitcoin work out has stimulated supplementary applications and blockchains that are apparent to the community are extensively used by crypto currencies. All the nodes validate the block and transaction.



**Fig 1.1: Block Components**

In block chain each block is connected to another block through last hash value. For the first block the previous has value will be zero and hence it is called as genesis block. The next subsequent block will contain the hash value of prior block and so on. Since block chain is a distributed ledger every transaction made through block will be visible to all. Each transaction in block chain will be having a unique transaction id. In block chain the proof of work will be maintained which means if any change is made in a single block will affect the all other connected blocks and the changes in block chain is immutable and It is mainly used for security purpose.

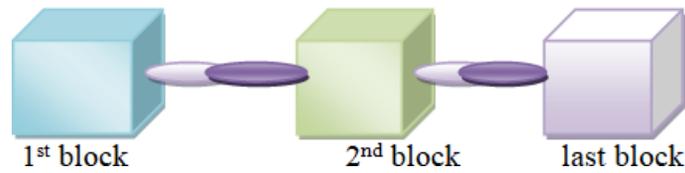


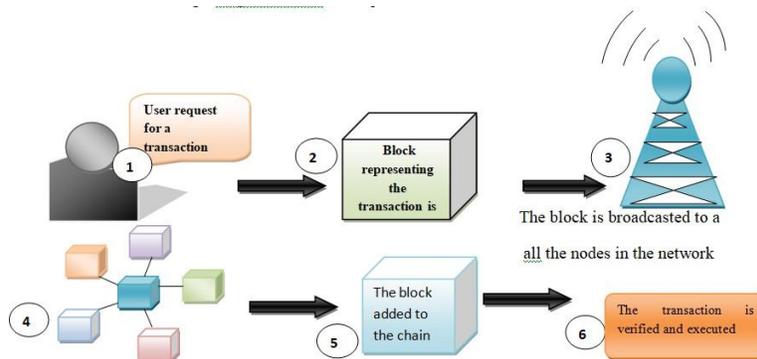
Fig 1.2: Representing simple blockchain.

The transaction process in block chain will be as shown in above figure. Blockchain technology has paying attention greater than ever in most up-to-date days. One cause in support of this latest drift is the preface of on-chain elegant contract enabling the accomplishment of decentralized applications in lower trust environments. Including this, attacks exploiting smart contract uncertainties are inexorably rising. To counteract these attacks and pass up breaches, some ways have been found such as documenting loop holes or representation scrutiny by means of official verification. [2]



Fig 1.3: Block chain progress Representation

Below figure shows the steps of how block chain works.



The surfacing of Ethereum Smart Contracts in 2013 boosted blockchain technology, which became blockchain2.0. As shown in Fig.3, blockchain 1.0 was primarily adopted by Bitcoin to crack evils regarding crypto currencies and decentralized expenses. Blockchain 2.0 paying attention on decentralizing the complete promote and is engaged to transform resources from first to last smart contracts, thus creating importance throughout the surfacing of alternatives to Bitcoin.[3]

## 2. LITERATURE SURVEY

1. **Julija golosova et al.[1]:** A review on the merits and demerits of the blockchain technology, briefs about evolution of block chain technology, explains block chain technology and block chain technology cases and also about merits and demerits of the blockchain technology.

2. **Tesnim abdellatif et al. [2]:** Author explains about official way to cross check and verify of elegant contracts based on users and blockchain behaviors models by briefing about the block chain technology, name register smart contract, modeling and verification environment, smart contracts specification and verification of the smart contract behaviour.

3. **Yusuke ejiri et al. [4]:** Briefs about recognition of data switch over and deployment society by blockchain and data sheath merit of conglomerate to accelerate co-creation and also explains about issues to realize recognition of data switch over and deployment society, data switch over and exploitation check plat for qualities of association.

4. **Koosha Mohammad hossein et al. [8]:** Gives introduction about blockchain-based privacy-preserving healthcare architecture. Which includes introduction and related work of technology, proposed bc-based architecture, users' data policies, architecture explanation, security and privacy analysis,

5. **Arpan Sarkar et al. [10]:** Author explains about Cloud Computing Model on EVM Transactions based on Block Chain for protected determination. Explains about voting and work related to online voting and block chain, techniques and algorithms, block chain based voting schema.

6. **Lai Jieyu et al.[12]:** Focuses on Research on Cross-border E-commerce Logistics Supply under Block Chain, the operation mode of cross-border supply chain under the block chain technology ,application innovation of cross-border ecommerce supply chain under block chain technology.

7. **liu songyue et al.[14]:** Discusses on purpose of block chain in business and secretarial field, introduction and the core technology of block chain, function of block chain technology in bookkeeping.

8. **Akanksha Kaushik et al.[15]:** Briefs about Blockchain – Literature Survey, introduction and comparison of centralization/decentralization, components of bitcoin,. Security analysis, wallet and cryptography, implementation parameters and constraints of bitcoin.

9. **Jameela al-jaroodi et al.[16]:** Author explains about blockchain in industries: a survey, introduction, blockchain, industrial applications, challenges, requirements, discussion and open issues.

10. **Ruksudaporn Wutthikarn et al.[17]:** Focuses on sample of blockchain in dental care overhaul application based on hyperledger originator in hyperledger foundation structure, introduction, architecture, blockchain section and workflow in dental care examine, rest server and angular outcome, scalability problem.

### 3. MERITS AND DEMERITS OF BLOCKCHAIN TECHNOLOGY MERITS

1. Block chain is a fresh technology which also be used for solving different kind of problems in industrial area.[1]
2. Block chain technology is not only records the economical and monetary communication but also makes virtual records for everything that has value[1]
3. Block chain provides security and reliability of the data .Each block is provided with the cryptographic hash of the preceding block where the hash's information is produced instantly and independently as a result hash's information cannot be altered.[1]
4. Block chain secure online polling facility based on cloud computing is a secure and transparent platform which provide proof of work facility, If an attacker try to cause any disturbance in the polling will result in causing the hash in breaking the link as soon as EVM detects the changes made in votes by preventing man in middle attack.[10]
5. Block chain is a decentralized network unalterable and indestructible technology[12].
6. Block chain builds trust because it has transparency in data processing. If any transaction has taken place at a particular node that in turn updated to all the nodes in that particular network hence all this process can be viewed by all the users of that particular blockchain.[12]
7. Hacking the block chain is difficult because it requires a huge power for processing [1][10][12]
8. Block chain maintain the data more accurately by providing high security and availability has a result of which the value of data increases[14]

**Demerits:**

1. It is costlier and the cost depends on the project we choose.[1]
2. It is complex to design and build the a secure block chain system than the comparable centralize system.[1]
3. Block chain depends on various factors such as government and legislative support.[1]
4. Block chain system are difficult to change. If we do something wrong[1][10]
5. The Block chain is not providing the overall security over the financial information.[14]
6. vulnerabilities are still an a large issue in block chain[14]
7. Scalability problem although block chain mechanisms was to make bit coin more secure. Each transaction comes with data with maximum size of 1MB per block as a result of which threeorfourtransactioncanbehandledbythebitcoinpersecond.Butifycryptohastogo to mainstream, it would need to process hundreds of thousands of transaction per second without causing a massive delay to customers and business.[17]

**4. BLOCKCHAINAPPLICATION**

In view of the fame and publicity gained by blockchain technology from previous years, it can be said that blockchain technology is a game changer and best innovative technology of bright future. Situate merely, it holds a record of each and every transaction which can be accessed by everyone, thereby removing the necessity for a central authority. It is a repository that collects data in encrypted blocks as shown below.

Some of the applications of block chain are Smart contract, Election (e voting), Finance sector, Retail sector, Documentation of flags, Hospital farma cesitical, Industrial management, Auto mobile, Toll, Government sector.

**1. Online payment methods:** Now a days the online money transaction has become a useful and needful payment method. As the banking transactions will occur 24 hours a day, the security and the accuracy of payments and transactions should be maintained for whole week. As the blockchain provides transparency of transactions, the payments will be more secure and easily accessible between the authorized and authenticated users.[1]

**2. Supply chain monitoring system:** In supply chain monitoring system the block chain is used to identify the inefficiencies and position of the existing objects present in the supply chain. Additionally, blockchain helps to know the yield produced and the quality of the objects, as the objects travels from the source to destination .[1][12]

**3. Reward programs for loyal retailers:** Using token based scheme within a block chain the token will be maintained for regular clients and incentives will be added based on the number of tokens by providing special offers which can be used to attract new clients. So that they can continue their shopping and should not get misused by fake reward programs.

**4. Auto title transfer for land and real estate:** The block chain is used to obtain a series of manuscript which are frequently used as a foundation of puzzlement. In order to buy or sell the property such as land, an apartment, or a vehicle the title is required with respect to the buying or selling entity. The block chain maintains the transparent and clear list of titles for opaque representation of permissible rights.

**5. Legal rights protection:** the growth in internet usage has made a huge impact on the copyright and patent maintenance on music and other substances. The blockchain ensures that the originator should get the royalty or a financial share on purchase of his content or digital downloading of the content belonging to the originator. The blockchain provides a clear and real time sharing of data and payment modes to musicians and content creators.[2]

**6. Making digital identities:** Now a days the making and maintaining the identity has become a kind of universal challenge. Microsoft (NASDAQ:MSFT) has taken a step toward identity challenges. It generates the digital IDs within its Authenticator app –which is in use by millions of population which would offers the organization and identification of users in a digital way. This allows the users in impoverished area to attain official welcoming of economic services, or begin their individual business, as an example. In the early stages the Microsoft has taken a step towards the era of digital identities in decentralized format.[3][14]

**7. Distribution of information:** Crypto currency IOTA launched a beta edition of its Data Marketplace in November, representing that blockchain could be used as a marketplace to share or sell unused data. Since the majority endeavor data goes idle, blockchain could act as an conciliator to store and move this data to progress a multitude of industries. at the same time as motionless in its before time stages, IOTA has more than 35 brand-name participants (with Microsoft being one) offering it comment.[4][10]

**8. Digital voting:** Blockchain offers the capability to vote digitally and also it's translucent adequate that any member in a network would be able to see if something is modified on the network. It adds up the simplicity of digital voting with the immutability (i.e., unchanging nature) of blockchain to make your vote trulycount.[10]

**9. Immutable data backup:** Blockchain might also be the perfect way to back up data. Even though cloud storage systems are intended to be a be present at foundation for data protection, they're not impervious to attackers who can hack the clous storage systems, or even infrastructure vulnerabilities. Using blockchain as a backup resource for cloud data centers or other data, as Boeing is in view of GPS receivers on its planes could determine this unease.[10][13]

**10 Food safety:** Yet an additional fascinating exploit for blockchain could be in tracing food commencing its source to your plate. Since blockchain data is immutable, you'd be able to trace the transport of food items from their source to the supermarket. What's more, should there be a food-borne disease, blockchain would allow the source of the impurity to be bring into being noticeably faster than it can be now.[16]

## 5. CONCLUSION

Blockchain is increasing the attention of users rapidly day by day. Blockchain has wide range of applications in copyright protection, crypto currency, healthcare, insurance etc. Here advantages and disadvantages of block chain has been briefed. Block chain promote deep integration with real economy and strengthen research core technology.

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