

Review on Precise of Blockchain Technology

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Abstract: Blockchain technology is becoming widely popular nowadays along with their decentralized peer- to-peer network and its privacy. Bitcoin is also widely storming in the world. Blockchain technology changes the lifestyle of people and business views on many fields through its privacy and security. Many researches were done on this technology because of its security and requirements in various fields of life. In the current era major issues are security on online translation, cloud computing, large data and Blockchain more focus on designing secure service. The objective of writing this review paper is to summarize what Blockchain is and spread awareness about its usage, security and how it works.

Key Words: Blockchain, Ethereum, Cryptocurrency, Bitcoin, Consensus Method or Algorithm, consensus rules, Hash, Genesis Block, Applications of Blockchain, Booming Domain of Blockchain

INTRODUCTION

Blockchain is a peer-to-peer Network where peers can communicate and do transactions with each other without support of any centralized system. Blockchain is a trending technology that has paved the way to solving various challenges in different sectors. It has received much interest from researchers over the years, as it is known to be a transparent, secured, no third party and tamper-proof public records repository system for documents, contracts, properties and assets. land title as being a major challenge in Nigeria due to the fact the existing traditional system, used to manage the sector is not effective, thus brought about issues such as, double spending, tamper, third party interference, it is not transparent. Hence the need for blockchain technology. The methodology considered for this research is Ethereum blockchain with smart contract which is written in solidity programming language. The research clearly shows the result of using Ethereum blockchain to manage land title and how the challenges of land title have been solved. (Obamehinti Adeolu Seun¹, Touraj Khodadadi², Sellappan Palaniappan³ - 2020).

Blockchain has been a prime invention in the past few years and nowadays everyone likes to invest in bitcoin and crypto so there is a question: is it safe? When you invest your money in a centralized system, it becomes easy to change and access by admin so somehow this method is not reliable. Now if we move onto the decentralized system which is not handled or accessed by only one person but is shareable with all the connected people and it's impossible to change or modify by anyone, so this type of system is more trustable than centralized.

This Review Paper Aims To Answer The Following Questions:

- [1] who invented blockchain technology and how it works?
- [2] Which Applications work for Blockchain Technology.
- [3] In which areas Blockchain technology is Used and what type of Benefit provides.
- [4] How Proof of Work method and Consensus Method or Algorithm work for Security of Blockchain Technology.
- [5] In a Current Market Booming Domains of Blockchain technology which helpful to expand business and provide enhanced security for transactions.
- [6] Demand for Blockchain Technology and Increasing Review Report.
- [7] What Cryptocurrency and how and when it used
- [8] Reward or Benefit of Blockchain technology and in which
- [9] What is Block, Hash and how it works to create a new block.

When was Blockchain Technology Invented

The concept of a decentralized ledger or blockchain, was developed by **Stuart Haber** and **W. Scott Stornetta** in 1991. These two men teamed up with Bayern (Digital Asset for Fan) and created a system that employed a chain of cryptographically secured blocks. This first accomplishment of the blockchain is commonly referred to as a Hash tree. It is believed that this technology is the brain behind Bitcoin.

According to Wikipedia **Satoshi Nakamoto** made Bitcoin with the help of blockchain and he is the first person to conceptualize blockchain in 2009. He published a whitepaper on blockchain technology, describing how digital currencies enhance trust. The first proof-of-work algorithm was introduced by **W. Scott Stornetta**. The protocol was made more secure using cryptography.

What is Blockchain Technology, its types and how its working

Blockchain technology is normally associated with cryptocurrencies such as Bitcoin. It is a database of records of transactions which is distributed, and which is validated and maintained by a network of computers around the world. Instead of a single central authority such as a bank, the records are supervised by a large community and no individual person has control over it and no one can go back and change or erase a transaction history. As compared to a conventional centralized database, the information cannot be manipulated due to blockchain's built in distributed nature of structure and confirmed guarantees by the peers (Computer Science and Engineering 2018, 8(2): 23-29 DOI: 10.5923/j.computer.20180802.02).

The blockchain is a decentralized ledger that allows members to share and exchange digital data. Unlike a traditional bank account, the blockchain is not a currency. This technology is a virtual ledger that connects people and applications in the world.

Let's understand more clearly about blockchain. As we maintain and store data of our daily work record it's called ledger. So, blockchain is the ledger and its single record is a single block. Blockchain is a chain of groups of blocks. Now if we talk about blocks, every block has some **data and information**.

- Blockchain stores relevant **information or data** and transaction information like from where it comes.
- The second thing stored inside the block is **Hash**. Hash is a Unique Id or Fingerprint. When we store any new data on a block, a new **hash** or unique id is generated.
- The third thing stored inside a block is **Prev hash**. Every next block has saved the previous hash and created a chain of multiple blocks. And in the chain of every first block which does not store the address of any block it's called **Genesis Block**. So, it's very easy to track the history of a block and keep record of all the information.

Types of Blockchain

Blockchain is used in many industries for transaction and business, but some people are saying blockchain is not secure. There are several types of Blockchains, some of the most important are:

Public Blockchain, Private Blockchain and Consortium Blockchain (hybrid Blockchain). Each type has its advantages and disadvantages, allowing them to meet the needs of various applications. Public blockchain which are open for all to transact and send money to others on this network. So, anyone can be a part of this network and join this public network. So, that's the issue when companies want to do secure

transactions and therefore companies want their own private blockchain network. For concern of security many companies started private blockchain. So, companies keep all their records safe without sharing on public networks and no one other party can be able to access that data without permission. So, a number of nodes and blocks are to be added in the blockchain it keeps secure by private network.

Federated Blockchain where a group of peoples or companies are known about each node and so no one can easily change the data or address of block. In More there are two other types, permissioned blockchain and permissionless blockchain.

APPLICATION FOR BLOCKCHAIN

Cryptocurrency (Bitcoin, Ethereum, altcoin, Litecoin)

Cryptocurrency is a digital currency that is not real or any central currency to uphold or maintain it. Such as a government or Bank. It is a decentralized system for verifying that the parties to a transaction have the money they claim to have, eliminating the need for traditional intermediaries, such as a bank, when a required entity transfers funds. Individual coin ownership records are stored in a digital ledger. The computerized database uses strong cryptography to secure records of crypto transactions.

Smart Contract

Smart contract has been around since 1994, when Nick Szabo, a computer scientist, developed them as self - executing digital code in mind. A smart contract is executable code that runs on the blockchain to facilitate, execute and enforce the terms of an agreement between untrusted parties. It can be thought of as a system that releases digital assets to all or some of the involved parties once the predefined rules have been met. Compared to traditional contracts, smart contracts do not rely on a trusted third party to operate, resulting in low transaction costs. There are different blockchain platforms that can be utilized to develop smart contracts, but Ethereum is the most common one. [*Blockchain Based Smart Contracts*: [accessed Oct 08, 2022]].

Transportation and Supply chain Management

Digital supply and transportation provide control, security and efficiency from start to finish. SCM is a bit complex to connect and simplifies the global supply chain. It's in high demand in the market. There are five components of supply chain management planning, sourcing, Manufacturing, Delivery and Logistic.

It's Effective because it minimizes cost and reduces time in the production cycle.

There are various platform uses Blockchain technology for security such as, Sensitive data storage, Digital Voting, Monitor supply chain management, Money transfer and payment processing

BENEFITS OF BLOCKCHAIN

Better Transparency

Transparency is the biggest issue in the current system. To improve transparency, organizations and companies have tried to apply more rules, regulations and validation, but there are some shortcomings which do not make a 100% system secure and transparent, i.e., Centralization. But, With Blockchain, an organization or company can go for a completely decentralized Network where there is no requirement of centralized authority.

A Blockchain consists of peers who are responsible for carrying out the transaction and validating them. Not every peer takes part in the consensus method.

Consensus Method or Algorithm

It is a decision-making process for a group, where individuals of the group construct and support the decision that works best for the rest of them. It's a resolution where individuals support the majority decision, whether they like it or not.

Let's clear this with an example. In a group of 50 people who want to make a project which is beneficial to each of them. Every one of them can suggest some idea, but the majority will be in favor of the one that helps them the most. Others deal with the decision whether they like it or not.

Now Imagine that same thing would happen within a group of thousands of people, so it becomes drastically more difficult to decide. Therefore, Consensus algorithms do not merely agree with majority votes, but agree with one that benefits all of them.

Enhanced Security

Utilized advanced security compared to other platforms or record keeping systems. Any transaction that is ever recorded needs to be agreed upon, according to the consensus method. Also, each transaction is encrypted and has a proper link to the old transaction using the hashing method. Security is also enhanced by the fact that each node holds a copy of the transaction ever performed on the network. So, if any malicious actor would make changes in the transaction, he/she would not be able to do as other nodes will reject the request to write the transaction on the network. Blockchain Network is immutable which means data, once written, cannot be reverted by any means.

Reduced Cost

Businesses spend lots of money to improve and manage their current network or system. That's why they want to reduce cost and divert the money to build up a new system or improve the current system. By using Blockchain organizations can reduce lots of cost to pay 3rd party vendors.

As blockchain technology is decentralized, so there is no need to pay cost to any vendor. And top of that there is less interaction needed when it comes to validating transactions. So, it reduces time and money for basic stuff.

True Blockchain Traceability

The use of Public, Private and Hybrid blockchain could introduce traceability, transparency and accountability in the movement of assets. With the help of Blockchain technology, companies focus on creating a supply chain that works on both vendors and suppliers. In the traditional supply chain, it's hard to trace items that can lead to multiple problems including theft and loss of goods. With blockchain, the supply chain becomes more transparent than ever. It enables every party to trace the goods and ensure that it is not being replaced or misused during the supply chain process. Organizations can also make the most out of blockchain traceability by implementing it in-house.

There are more several benefits of Blockchain in Government, Healthcare, Trade Finance, Logistic, Energy Sector.

SECURITY LAYER IMPLEMENTATION IN BLOCKCHAIN

If anyone wants to create a new block first it will take 10 minutes to create a block and it will be shared with the whole network if majority of the votes for new changes are accepted, then the block is added to the blockchain. If we want to change data of any block, its hash automatically changes and if the hash of any block is changed then pass irrelevant information in the next second block and in the same way every block gets the wrong hash. So, whenever a block hash is changed, the block's data after that block becomes irrelevant or wrong.

Now if we change the hash of all the blocks, it will take too much time to change the hash of all the blocks and if the block hash is invalid it will break the block because the hash is no longer valid. It takes approx. 10 minutes to change 1 Block Hash. So, it's hard to change the hash of multiple blocks. The **Proof of Work** method calculates the time of changing a hash address.

The proof of work concept is considered more secure compared to other algorithms as it is almost impossible for the malicious to attack unless it acquires 51% of computing power which is impossible made by blockchain structure.

The third security layer added in this technology is that all the present hash in a network has one copy of the whole blockchain so if you want to change your block you need to share it with everyone and check whether every vote for this change is relevant or not. If change is not true, the majority of the vote for you temper on data of all blocks and your change has been blocked and this type of system is called **consensus rules**. So, if any person wants to harm blockchain, they need to spend more time to change each block hash and need to open 80 % of the network for majority of the vote for changes.

BITCOIN AND BLOCKCHAIN: HOW ARE THEY RELATED

Many people still get confused about how bitcoin and blockchain are different. So, bitcoin is a cryptocurrency which is an application of Blockchain and Blockchain is a technology that works on various platforms. So, when you are working on Blockchain it's not compulsory to learn bitcoin or cryptocurrency. Whereas Bitcoin is currency and Blockchain is technology that built bitcoin and to work with bitcoin need to understand about blockchain and bitcoin is dependent on Blockchain technology. Without blockchain the bitcoin is not secure because the role of blocks is to provide enhanced security. Blockchain provides a substantiated database and ensures that all claim transfers are securely transferred.

BOOMING DOMAIN OF BLOCKCHAIN

Cryptocurrency

Crypto is a new form of digital money powered by Cryptography. It started in 2008 with Bitcoin and you can use it to transfer as a fund or money to anyone or anywhere globally. If we take an example of Bitcoin, the bitcoin element is a mediator like a Bank and does transactions directly through the bitcoin of any of the currencies anywhere in the world and its charges are very low compared to other translation processes like there is no conversion from dollar to rupees. It transfers as bitcoin to bitcoin.

Blockchain uses killer feature-cryptography. Symmetric encryption is equivalent to using the same key to open and lock the door. Asymmetric encryption is equivalent to using a pair of different keys to open and lock the door, namely, public key and private key. If you use the public-key encryption, you can use the private key to decrypt; if you use private-key encryption, you can use the public key to decrypt. These two keys are generally stored in the user's personal wallet. Once the private key is lost, the assets are gone. It is relatively safe in the blockchain in which the public key and private key are formed through multiple transformations, and the characters are relatively long and complex (Zhonghua Zhang,¹Xifei

Song,²Lei Liu,²Jie Yin,²Yu Wang,³and Dapeng Lan⁴)

Real Estate Domain

In the Real Estate domain, most of the notary work is done with the help of blockchain so all the records of buying and selling are stored in it, and we can easily trace the history of any property.

The extensive run through will maintain, improve and will show up on real estate company strategies and structures across the world. This reliable reformist advancements in the field of real estate can be considered by experts and individuals as this would make the process easy and less burdening. However,

within the primary area, there should be coordination inside the squeezing thoughts, limits, and jargon you get on more value sticker price houses. Through blockchain, monetary experts may need to replace the program to purchase and advance even divisions of tokens as they see it fit. What is more prominent is, fractional possession may assist them with the lease, sale and purchase. Upping all amounts can lead to a pivotal accusation and adjusting of the populace is likely a bothersome effort. Dependent upon the expressions, landowners may likewise similarly keep up acknowledging utilization in their assets (Yarlagadda Jyotsna - 2020)

Ethereum

Ethereum is a technology for building apps and organization, holding assets, transacting and communicating without being controlled by a centralized authority. There is no requirement to hand over all your data to Ethereum - You keep control of your own data and what is being shared. Ethereum has its own cryptocurrency, Ether, which is used to pay for certain activity on the Ethernet network.

INCREASING REVIEW REPORT

In trends of technology, Blockchain is highly paid tech regarding research on LinkedIn.

According to the Report overview of Grand View Research the global technology market size was valued at USD 5.92 billion in 2021 and is

expected to grow at a compound annual growth rate (CAGR) of 85.9% from 2022 to 2030. The legalization of cryptocurrency in countries, such as Ukraine and El Salvador (a country in Central America), is expected to create new opportunities for market growth. The legalization of cryptocurrency encourages businesses and investors to invest more in blockchain technology. Furthermore, it also encourages the market players to make more efforts to improve their services to gain a competitive edge. These efforts made by the companies are expected to make blockchain technology more effective and efficient soon.

CONCLUSION

The recent development in new systems and technology is relatively good but it's very rare to develop a system that secures centralized and decentralized data. Blockchain technology is a very fast-growing technology in the last 5 years and innovation runs in every application of blockchain technology. It is popular because of its decentralized system and less human interactions. In various fields Blockchain technology is booming by its secure application. Various secure layers are developed which are helpful for implementing security on this technology.

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