Concepts and Applications of Blockchain Technology

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Abstract: *Blockchain means block which contains the information. This technology is used for high security purpose, which believes to be the next revolution of the internet. Blockchain can be thought of as an overarching concept that includes many different technologies and applications. The banking sectors have been announced to use this technology by 2030. Blockchain stores information across the network in personal computers making them not just decentralized but distributed. This means no central company; each and everyone can build one's own system, which helps to use it. This is important, because it makes difficult for anyone to take down the network or corrupt it. The peoples who are running the system use their computers to hold the bundle of records submitted by others known as blocks, in a chronological chain. A form of digital cash is called bit coin. People from all over the world help to move the digital money by validating other bit coin transaction with their personal computer. Bit coin uses the block chain by tracking records of ownership over the digital cash. So, only one person can be the owner at a time and the cash cannot be spent twice, like counterfeit money in physical world. But bit coin is just a beginning for block chain in future. Block chain is used in many fields for voting, hospitals, E-commerce, music etc.*

Keywords: Blockchain, Diffusion of Innovation, Text Analytics, Bitcoin, Ethereum, Cryptocurrency

1. Introduction

Blockchain technology was introduced by satoshi nakamotto. This technology is the next revolution of the network [3]. The information is stored in a blocks format. That is also called the distributed data base system. This is working with the Peer-to-Peer networking concept, but no centralized. Each node is working independently. The concept of block chain is the number of people who can form the groups. Everyone can join with the chronological relationship [1, 2] and then they will get the amount of transaction. These transactions are stored on a digital ledger. These digital ledgers include the information for digital transaction details like debit money, credit, and current balance. The digital transaction details are also very transparent and at the same time they are very secure, which means no one can change that details. Only the authorized person can see and handle the details but cannot manipulate any details for the digital ledger. This is also like (ROM) Read only memory, The persons can only see the information but it is not possible to provide any changes to the digital ledger, Each digital ledger information is stored in a one block format, Then this technology can provide the high security password to each block. If one node is compromised, then it can no longer participate in the chain from the other participants.

a) Double Spending
A major challenge of digitizing assets is the potential to spend /redeem/use an asset multiple times. Because digital assets are much easier to forge than many traditional assets (such as) currency, tickets, physical coupons, etc.,) a secure system is required to ensure that an asset is used only once. With block chain, every time an asset is used consumed, the owner of the asset signs the transfer with the private cryptographic key. This key is unique to the owner and is extremely difficult to forge. In order to initiate the transaction, the transferor requires both the asset and their private key. The block chain will check both the validity of the key, and ownership of the asset. Therefore, even if the asset is cloned, it cannot be used without the private key.

Once the transaction has been committed to the chain, the owner of the asset will be changed. This means, each node that receives a second transaction requesting transfer of ownership (or redemption) will see that there was a previous transaction that already transferred the asset and will reject that transaction. This prevents a second transfer block from being added to the chain.

b) Blockchain Ensure Privacy
Personal data and identities are not required to be stored in the chain. Such data are stored as a hash value which provides both anonymity and security. The user may provide data such as their name, telephone number, email address, face book account id, unique user name, password etc. In reality a combination of these values is used to determine their identity. These data are hashed to provide a unique token that can only be recreated by providing the original values, and only this hash is stored to identify the party in the chain. Since it is impossible to obtain the input values by reverse engineering a hash value, the user is practically anonymous to all parties within the chain. But they can validate whenever required by providing the original values used to create the hash.

2. Concept of Summary

Blockchain means block which contains the information. This technology is used for high security purpose, which believes to be the next revolution of the internet. Blockchain can be thought of as an overarching concept that includes many different technologies and applications. Then each block contains cryptographic hash (a unique finger print) of the previous block, creating a chain that can always be validated by checking the hashes back to the original root block. Before a block can be committed, all participants are required to validate the transaction and provide consensus that the block can be added to the chain. This effectively makes it impossible to add a record unless all parties participating in the block chain. The records are chained together by their hash value. Once committed to the chain, all records are immutable (they cannot be changed). It is

impossible to alter a previous record without altering every party's copy of the chain. This password method is used to protect our details from the hackers. Hackers cannot steal this kind of transaction. The block chain relationship and transaction is illustrated in the figure.1 and figure 2.
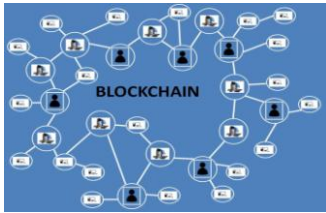

Figure 1: Block Chain Transaction
(www.conversion-uplift.co.uk)

Figure 2: Blockchain relationship
(www.evolving-science.com)

3. Block Chain

Blockchain is the distributed database system which implies the parties to share and every one can trust. This is very transparent. In this system everyone in that group can see the detail but not change it. Then the information can be stored in the block format. The following data is stored on each block.
1) The data stored on this block
2) The hash value for the data on this block
3) The hash value in the front of the block

Each block information's are stored on a digital ledger. Every person's amount of transaction is saved in a block form. Like many other blocks, this creates a chain of connectivity. Each block is associated with the previous block. Each block has a hash value. Hash value is the one type of the unique password. This password helps to secure your transaction details. People in the group like this can easily see the transaction but cannot make any changes. Only those in the group can see that transaction. The reason is that a person's transaction is more secure. The hash value changer on that block is someone who wants to steal information or wants to make any changes. An alert message will be given to people who do that transaction when there is a change in the password. It is unthinkable for a hacker to steal the information on a block. Every person's information is stored in a computer in ledger format. Everyone will be watching the transaction details. If a hacker wants to steal information on a system he cannot steal, only the hacking of all the people in a group can hack it. But that's not happening. Because each person have an individual hash value in each block. They are not like ordinary password; it is mingle of numbers, alphabetic, special characters, and extra mathematical signs. This password is not easily understood. So if the hacker is stealing, each split can compare the previous block value to

the information stolen only if the value is correct. Thus block chain technology is used for high security purpose. The peer-to-peer network is used to perform this type of transaction. The peer-to-peer network is the information that a person has to go to the next person without any interfaces directly inserted. This block chain technology works on the network concept, but not at all centralized.

BITCOIN

Bitcoin is introduced in year of 2008. Which is the first crypto-currency for using the digital transaction system? Bit coin is a type of digital currency that can be used in a digital transaction in block chain method. It is only available in online. Bit coin is the point-to-point or peer-to-peer electronic cash system. There are some kinds of address available in every bit coin. This address helps you to identify who you want to transact. The bit coins have addresses to every bit, which helps to identify the transaction. [10, 11, 12] One type of algorithm is created every time a transaction is made. This will be in mathematical form to see. If this algorithm is solved we can earn a bit coin. Bit coin is created in maximum of 21millions. If the demand is greater, the value of bitcoin is higher. If demand is less bit coin's value is low. In the Indian currency, only 2 crore 10lakhs will be created by bitcoin. Currently about one crore bitcoin have been created. We can earn bitcoin in two ways. The first way we can go and create an account for the following sites to go indian currency can be given away and bought bitcoin.
1) UNICOIN
2) BUYCOIN
3) ZEBPAY
4) COINSECURE
5) LOCALBITCOI

The second way is data mining. Which means every transaction is form the block format. Each and every block is to create a hash algorithm, for anyone to solve this algorithm to earn money.

Figure 1: (www.thesouthafrican.com)

Figure 2: (www.livemint.com)

These kinds of addresses can be performed by transmitting to another person. An address can transact online to one person or a number of people. Some people use these bit coins to convert the black money into white money.
1 bitcoin= 2, 78,374.0 Indian rupees.

Bitcoin VS Normal Currency

Normal currency is in physical format. The user can touch and feel this currency. We deposit (or withdraw) this currency directly into a bank. But crypto currency is only available in electronic format. Each country will call the currency with each name, like dollar, euro, and dinar etc,. But crypto currency is known around the world with the same name. Recent demonetization has created a massive problem among the people. Now many bank- notes are invalid. Many people were affected by this. But crypto helps to currency to prevent this effect. [4,5]

4. Literature Review

Blockchain is an immortal digital ledger with economic transaction. It can be recorded not only of financial transactions but almost all of the values. A spreadsheet picture duplicates thousands of times across a network of computers. This network is continuously designed to be renewed and you have a basic understanding of the block. The information held on the block is partitioning and continuously re –database. This is the way to use the network with open benefits. The blocks of database is a record of records without being stored in any place or is really public and easy to read. Any centralized record of this information is not a hacker scam. Millions of computers will be provided to anyone on this website simultaneously.(Don & alex tapscott, authors blockchain revolution(2016).[4]

Features of block chain
- Hash value
- Peer-to-peer network
- Digital ledger
- No centralized

E. Application of Blockchain

Bit coin uses the block chain by tracking records of ownership over the digital cash. So, only one person can be the owner at a time and the cash cannot be spent twice, like counterfeit money in physical world. But bit coin is just a beginning for the block chain in future. Block chain is used in many fields such as
- Voting
- Hospitals

Now I explain how block chain technology is used in voting.

In future block chain technology will be used by the election commission. This technology is used to fix the mistakes made by the election commission. Several fake votes are cast in places where voting is going on. This can be blocked using blockchain technology. Only an election commissioner is allowed to vote in the presence of a single person who is easily deceived. This creates a number of problems in politics. All information in blockchain technology is stored in a block form and encrypt. It will be watching all those in the electoral council. This information is stored in a digital ledger format into a database. These are transactions through the peer-to-peer network and are monitored by many. Once someone voted, his vote system will be locked with the hash value. Alert message will be given to the election commissioner if the same person attempts to vote again. Such blockchain technology plays a major role in many fields.

5. Conclusion

Blockchain technology is the next revolution of the network. The block chain technology was created to rid the problem of hackers. Information of this technology is shared by many people and then monitored. All the information is saved in the ledger format into the database. The network is functioning without any centralized technology. All the information will be independent and transparent. Hacker is very difficult or impossible to steal our information. Currently this technology is used in banking sector. But it is just a beginning for there will be overwhelming use of blockchain in future Blockchains are used in many fields for voting, expression hospitals, E-commerce, music.

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