Blockchain Technology: A Study on Structure, Classification, Applications of Blockchain

Archana Nagelli[1], V. Vinod Reddy[2], Kireet Muppavaram[3] Vishwesh Nagamalla[4]

[1] Assistant professor, Dept of CSE, Sreenidhi Institute of Science and Technology, Hyderabad
[2] Assistant professor, Dept of IT, Sreenidhi Institute of Science and Technology, Hyderabad
[3] Lecturer, JNTU College of Engineering, Hyderabad
[4] Assistant professor, Dept of CSE, Sreenidhi Institute of Science and Technology, Hyderabad

Abstract: Blockchain advancements standout the most well known issue in the recent times, it has officially changed individuals way of life in some places because of its incredible influence on numerous business or industry, and what it can do will even now proceed with impact in numerous places. Inspite of the fact that the element of blockchain advances may bring us more solid and helpful administrations, the security issues and difficulties behind this in-novative procedure is additionally a vital theme that we have to concern. This paper discusses a clear study of Blockchain technologies, cryptocurrency, Blockchain classification and its structure, applications
*Keywords: Blockchain, advancements, Cryptocurrency*

I. INTRODUCTION

Blockchain is a decentralized technology. A worldwide system of PCs utilizes blockchain technology together to deal with the database that records Bitcoin exchanges. That is, Bitcoin is generally managed by its network but not by any centralized authority. The presentation of digital forms of money which generally called as cryptocurrencies, particularly Bitcoin, has brought the idea of blockchain innovation into the standard[1]. A blockchain is a constantly developing distributed database that ensures against altering and modification of information. Blockchain isn't simply constrained to the budgetary framework; rather, it is an incredible answer for any stage or item that requires trust, for example, keyless automobile entry authentication. he thought behind blockchain, to put it plainly, is to have the capacity to set up and confirm trust without the need of a unified framework.[2].Rather, this power would be given to a decentralized system, making it more secure as well as both more effective and quicker proportional. Bitcoin is the primary utilization of blockchain, it's a sort of computerized cash in light of blockchain advancements, utilizing for exchange things on the web like cash as we do in this present reality. Since the achievement of Bitcoin, individuals now can use blockchain advancements in many fields for example, money related market, IOT, production network, voting,restorative treatment and capacity.

II. THE STRUCTURE OF BLOCKCHAIN

The Block contains maindata , hash of current and previous blocks ,timestamp and other information which is shown in the figure below
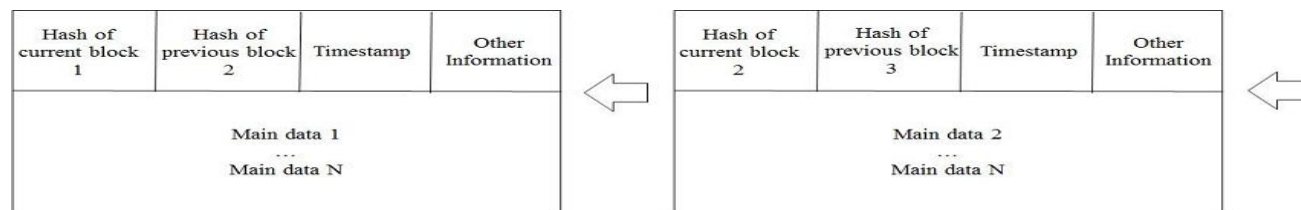
Maindata consists of the data which is related to the service ,ex IoT data record , some kind of transaction record etc.

1) *Hash:* When a transaction executed, it had been hash to a code and then broadcast to each node. Be-cause it could be contained thousands of transaction records in each node's block, blockchain used Merkle tree function to generate a nal hash value, which is also Merkle tree root. This nal hash value will be record in block header (hash of current block), by using Merkle tree function, data transmission and computing resources can be drastically reduced .
2) *Timestamp:* The time taken to generate a block.
3) *Other Information:* Other information like nonce ,data signature or signature of dataetc

III.WORKING OF BLOCKCHAIN

Blockchain works in the following steps

1) All the nodes are connected in a decentralized fashion.
2) Initially sending node sends the new data which is broadcasted into the network.
3) The receiving node receives the data and checks the data, if the data is appropriate then it is stored to a block
4) All the nodes in the network execute proof of work(POW) ,Proof of stake (POS) algorithm to the block.
5) Only after executing Consensus algorithm, the block will be stored in the chain.

IV.CLASSIFICATION OF BLOCKCHAIN

Blockchain are classified into three different types

1) *Public Blockchain:* The Blockchain is generally called as public when anyone or any member can become a participating member in the network without any sort of conditions.
2) *Private Blockchain:* The Blockchain is generally called as private if the group is closed, the members of the network will be selected before for any sort of usage like downloading ,protocol usage etc.
3) *Consortium:* These are partly decentralized , it is similar to that of private blockchain but the only difference between consortium and private blockchain is private blockchain are handled by single entity but in consortium it is operated under the leadership of a group.

V. APPLICATIONS OF BLOCKCHAIN

Following are the Blockchain applications which have impact on Transforming the society.

A. Financial Services

At present Traditional systems are slow to use as it involves many intermediaries to complete a process which leads to several conflicts leading to have its effect in terms of cost and time.[3]. Blockchain is cheaper,effective ,transparent many growing number of Financial services are using Blockchain in terms of Smartcontracts, Smartbonds.

B. Asset Management

Traditional Trade systems within asset management are slow to use as it involves many intermediaries like brokers, custodian, settelement manager leading to have its effect in terms of risk cost and time[4] .The blockchain ledger which keeps tracks of transactions reduces the error by encrypting all he records., the ledger also simplifies the process, while canceling the need for intermediaries.

1) *Insurance: Claims Processing:* Claims processing is the hectic procedure where the insurance processors have to deal up with fraudulent claims ,abandoned polilcies etc and mostly these forms are processed manually as a result of that there is large scope for errors. The blockchain provides a perfect system for risk-free management and transparency[5].Its encryption properties allow insurers to capture the ownership of assets to be insured.
2) *Smartcontracts:* Smart contracts are digital which are embedded with an if-this-then-that (IFTTT) code, which gives them self-execution .which ignores the intermediaries involved in a process[6]. The blockchain not only waives the need for third parties, but also ensures that all ledger participants know the contract details and that contractual terms implement automatically once conditions are met.

C. Healthcare

The Electronic health records are moreless facing the privacy problems .Blockchain provides a system where healthcare records are stored by encoding and the access grant wil be given only by the specific individual private keys[7].

D. Music

The problem in Music industry is based on the ownership rights, copyrights. A decentralized database of music rights is created by blockchain technology which solves the problem the owenership problem. The payment will be paid by digital currency based on specific terms of contract.

E.   Birth, wedding, and death certificates

The blockchain would make record-keeping more reliable and trusable by encrypting birth and death certificates and empowering citizens to access this most crucial information.

F.   Personal Identification

Blockchain ID is a digital form of ID which is engineered to replace all forms of present physical identification. In the near future, fintech scientists say we will be able to use the one digital ID for signing up. It is open source, secured by the blockchain, and protected by a ledger of transparent account

VI. CONCLUSIONS

Cryptocurrencies of all types make use of distributed ledger technology known as blockchain. Blockchains provides a decentralized systems for recording, documenting transactions that take place involving a particular digital currency. In this paper we have discussed the basics of Blockchain technologies ,structure of Blockchain, working of Blockchain ,Classification of Blockchain ,Applications of Blockchain.

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