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Blockchain Technology Beyond Bitcoin: An Overview

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Abstract

Abstract - The financial and technological industries are traverse through the possibilities in blockchain. A blockchain is a distributed ledger of all transactions in a bitcoin mined process. Blockchain is underlying technology of bitcoin. Blockchain provides security, anonymity and data integrity without intermediary organization, due to this reason it creates more interest to research on Blockchain. The objective of this study is to understand the current research topics, challenges and future directions of Blockchain technology from the perspective of applications of blockchain. Blockchain also offers the potential to become an essential component of the infrastructure for the Internet of Things.

Keywords: Blockchain, Bitcoin, Distributed ledger

1. INTRODUCTION

Blockchain, the name itself it says that it is a chain of blocks. These blocks are storing the continuous growing list of records[1]. In this technology all the blocks are linked and secured using various cryptography models. It is the underlying technology of crypto currency Bitcoin. It modernize the way of conducting all the commercial transactions. The term Bitcoin is also known as virtual currency, crypto currency[2], digital currency[3] and non-governmental currency. It has its own payment system[4], it means no bank. But it requires transmitter for money to clear and settle its transactions. It takes very less time to complete. The process of this work is done through the decentralized manner.

Bitcoins work as currency, but it is an electronic cash system[5]. Through the "mining" process bitcoins are generated. In this process the participants in the bitcoin ecosystem generate Bitcoins pursuant to established protocols. The mining process also verifies the Bitcoin transactions by using the complex mathematical computations, which are generated by sophisticated computer hardware. Thus this process is allotted to private parties to validate the bitcoin transactions and also concurrently distribute the bitcoins.

Consider purchasing an item using credit card in online Shop, there we are spending digital cash to purchase that item. This digital cash having a digital le similar to PDF. To verify the spending of digital cash, it can be duplicated by the bank(or institution). It illustrate the concept of double-spend issue. Instead of this bitcoins are used to pay, which takes very less process.

In the procedure of bitcoin blockchain, the ledger reflects ownership of bitcoins. In this when person 'A'(or Customer, who purchasing the book) wants to transfer the money to person 'B'(or online shop) , then 'A' transfers bitcoins . this transaction is integrated and published to the network. The transferring party owns the bitcoins and deliver to 'B'. In some other case i.e. if bitcoins are already delivered to 'B', then the transaction is considered as not valid and it is rejected in the network.

In general terms, we can use bitcoins, by downloading the "Bitcoin miner" software on mobile or computer. These bitcoins got from application stored in digital wallet. By using these bitcoins purchase video games, gifts, books and can transfer money to anyone.

The remaining paper is scheduled as follows. Section II - it gives history of bitcoin i.e from where the bitcoin work started. Section III – it gives an idea on blockchain technology i.e what exactly blockchain technology and bitcoin?, what are the types of blockchains? And what are the applications of blockchain technology? Section IV – it gives the conclusion of the study.

2. HISTORY

Year	Work
1991	first work on secured chain of blocks
1992	Incorporated Merkle trres to the block chain
2008	a core component of the digital currency bitcoin
2009	Bitcoin v0.1 released and announced on the cryptography mailing list and also First Bitcoin transaction[5]
2014	• Bitcoin blockchain file size reached 20GB • Blockchain 2.0 technologies go beyond transactions
2015	30GB
2016 to 2017	• 50 – 100 GB • pilot project based on the Nxt Blockchain 2.0 - blockchain-based automated voting systems. • 13.5% adoption rate within financial services • an initiative of Chamber of Digital Commerce

Credit card processing is not that much of secure on the internet in the late 1990s. To overcome such type of problems, introduced a chain of blocks with cryptographically secured in 1991s. In 1992s to improve the efficiency of block chains, Merkle trees were incorporated. With the help of this block has to collect several documents. With the help of this work implemented a first distributed block chain in the year 2008, it is the core component of the bitcoin i.e. digital currency. Here the bitcoin serves as Public ledger for all the transactions. In the year 2009, bitcoinv0.1 was released and also the first bitcoin transaction also done in the same year. blockchain2.0 technology introduced in the year 2014 and it works beyond the transactions and also bitcoin block size reaches to 20GB. In the next three years it reached to upto 100 GB. The popularity of using bitcoins graph is daftly increased to more.

Innovations of blockchain and bitcoin concepts are summarized as follows[1]:

- The first innovation is bitcoin, a digital currency.
- The second innovation is blockchain, which realizes the concept of bitcoin.

- The third innovation is "smart contract", which are embedded in second generation of block chains known as "Etherum".
- The fourth innovation is "proof-of-stake", which is cutting edge of blockchain.
- The fifth innovation is going on the issues of blockchain scaling.

3. BITCOIN AND BLOCKCHAIN

Blockchain is a chain of blocks, which contains decentralized transactions. Blockchain technology is underlying concept of bitcoins. Bitcoins are converted from and into conventional currency through online exchange portals, which are operated privately. Now - a - days, without converting from bitcoins to conventional currency, the bitcoins are accepting in businesses and individuals. These transactions are grouped and recorded as "blocks" on a shared ledger. These blocks form a chain like one after other on a ledger, is called "blockchain". This technology is called as "blockchain technology" or "distributed ledger technology(DLT)"[4], it is good to clear and settle bitcoin transactions in other assets such as Securities, medical records, commodities. This technology widely increasing its potential in different assets. It involves ledger of transactions, which are maintained by servers in a network. These servers are known as "nodes". Each node contains a ledger, which represents the ownership of assets. This ledger is maintained by all the nodes in a network. Thus the ledger is "distributed". Validated transactions are grouped into "blocks" and these are added to ledger. For these transactions integrity is maintained by using different cryptographic methods. This process of generating bitcoins is called "Mining". The fig:1 illustrate the above mining concept.

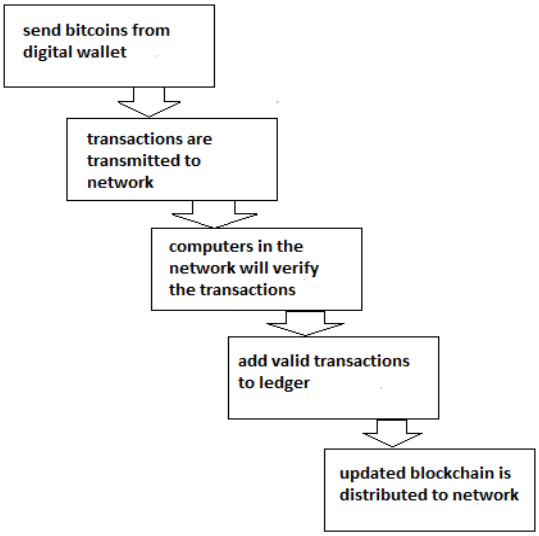

Fig1: **The process of bitcoin mining**

In the case of the Bitcoin blockchain, the distributed ledger reflects the current ownership of bitcoins at any given time, as well as all prior Bitcoin transactions going back to the creation of the Bitcoin blockchain. Thus, when a party transfers Bitcoins, the transaction is published to the network, which confirms with a very high degree of confidence that the transferring party owns the Bitcoins and hasn't, for example, already transferred the Bitcoins to someone else. Transactions that are not validated across the network are rejected.

In other words, the network establishes trust in the transaction without the involvement of a typical intermediary, such as a bank. And also these transactions are more secure difficult to hack.

A. Types of blockchain

Blockchains are in different types due to the participates of mining process. These blockchain types are[6]

- Public Blockchain
- Private Blockchain
- Consortium Blockchain

In public blockchain anyone can read and send transactions. In this process anyone will participate. Prominent examples of public blockchain are Etherum and Hyperledger project. Private blockchains are central to one institute. Example for this private blockchain is Microsoft, it has its own supply chain. In the Consortium blockchain, a set of preselected participants are control the consensus process.

B. Applications of Blockchain

Bitcoins are used as virtual currency, when the blockchain technology is added to it, bitcoins works as more efficient than initially it is. With the help of the updated blockchain technology to the bitcoins, it is not only used as money other than it. Blockchain technology will give big shift[7] in financial institutions in coming years. Here in the following list it shows some of the applications of blockchain technology.

Applications of blockchain beyond bitcoin:

- Decentralized exchanges
- Digital voting
- Smart contracts
- Distributed cloud storage
- **Supply chain communications and proof-of-provenance**
- Digital identity

(Passports, Birth Certificates, E-Residency, Wedding Certificates, IDs these are areas where blockchain used in identity applications)

C. Risks of Bitcoins

In this fast era, due to the reason of potential of blockchain technology it creates more interest on research area of bitcoin blockchain technology. It also offers the potential to become an essential component in the infrastructure of Internet of Things[7]. Here showing the some of the risks in bitcoin to the researchers to work on it.

The primary risks of bitcoins are [6]:

- Scaling issue is faced by Bitcoins(Present it process 7 transactions per second).
- Regularization of bitcoins by the government.
- All the places are not updated to use the bitcoins.

4. CONCLUSION

Blockchain technology is a distributed ledger to record the transactions in a mining process of bitcoins. This study gives an idea about blockchain technology and bitcoin, history behind the blockchain, applications of blockchain and also it gives an idea on future directions in the blockchain technology.

REFERENCES

[1]. Vinay Gupta, "A Brief History of Blockchain", Harvard Business Review, February, 2017.
[2]. Jesse Yli-Huumo, Deokyoon Ko, Sujin Choi, Sooyong Park, Kari Smolander, "Where Is Current Research on Blockchain Technology?—A SystematicReview", PLOS ONE, October, 2016.
[3]. J. leon Zhao, Shaokun Fan and Jiaqi Yan, "Overview of business innovations and research opportunities in blockchain and introduction to the special issue", in Springer open, 2016.
[4]. Marco A. Santori, Craig A. DeRidder and James M. Grosser, "Blockchain Basics: A Primer", Pillsbury Winthrop Shaw Pittman LLP, May, 2016.
[5]. M. Crosby, Nachiappan, P Pattanayak, sanjeev varma and vignesh kalian, "BlockChain Technology Beyond Bitcoin ", Sutardja Center for Entrepreneurship & Technology Technical Report, October, 2015.
[6]. Cameron McLain, "A Brief History of Blockchain: An Investor's Perspective", www.themission.co, November, 2017.
[7]. "Blockchain and the law An uncharted landscape", "Clyde &Co".

