






Postulation of Blockchain technology as a core of Digital Era

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Abstract

Abstract. The Blockchain is a technology that is at the heart of cryptocurrency innovation by putting in place computer programs for consensus, validity, and verification in a brand-new system called the blockchain. The blockchain infrastructure now includes compute components, opening a vast array of opportunities beyond basic money transfers. Though being in its infant stage it has entered in all business and sectors. With the speed of digital transformation and its acceptance across all layers of audience it's nevertheless to be called as the FUTURE. We live in a technologically dominant era in which most actions, whether in daily life or broader socioeconomic efforts, are inextricably linked to technology, making it more relevant than ever before. One of the most frequently discussed upcoming technologies with enormous promise is blockchain technology. On a welcoming note, and due to novelty, blockchain technology is invading into all sectors right from health, legal to video games. Block chain is much more than crypto currency for which is now been primarily used and bitcoin is just a glimpse of it. In this paper the researcher will assess into literature concerning Blockchain technology and examine its recent applications in various fields of this digital era.

Keywords: Blockchain technology; supply chain; application; Unspent Transaction Output; Reference numbers; decentralized network.

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1.Introduction:

1.1 Overview cryptocurrency:

Digital money called as cryptocurrency or crypto is utilized as an alternative payment method or as an investment. They get their name from the cryptographic technologies that allow anybody to purchase, trade, or exchange cryptocurrencies securely without the need for a centralized authority, such as a government or financial institutions. For instance, Bitcoin was created largely to serve as a payment method that is neither distributed nor controlled by a central bank.

Cryptocurrencies as a payment medium in India are not regulated by any central authority. With Cryptocurrencies not been given importance in other countries. India is among the very few counties to regulate Cryptocurrency under taxation [1].

1.2. Review of literature:

We live in a technologically dominant era in which most actions, whether in daily life or broader socioeconomic efforts, are inextricably linked to technology, making it more relevant than ever before. One of the most frequently discussed upcoming technologies with enormous promise is blockchain technology. Blockchain is viewed as a widespread technology with the potential to disrupt practically all sectors. It is an essential component of the Web3 progression. According to a World Economic Forum (WEF) estimate, as much as 10% of global GDP would be kept on blockchain by 2025.

Jyothi Khare (2020) examines in her paper blockchain as an incredible technology in the banking sector considers staff knowledge and understanding. Banks can reduce transaction costs and paper consumption by implementing blockchain technology [3]. Hence, this paper delved into literature concerning blockchain and examined its recent applications over the past few years. In India, Blockchain technology has gained widespread adoption across various industries in India, encompassing healthcare, entertainment, insurance, manufacturing, and banking and finance. The research aims to delve deeply into the mechanisms and operations of blockchain technology, exploring its significance in diverse ways for banks. Additionally, the study underscores the importance of integrating this technology into various banks, emphasizing its potential to streamline and enhance the efficiency of workers' tasks.

According to the NASSCOM Avasant Republic of India Blockchain Report (2019), there is ongoing progress in blockchain innovations. The emergence of Blockchain 3.0, which enhances capability, efficiency, and security, is on the horizon, presenting new opportunities for blockchain to deliver tangible business value. Despite the innovation potential and a limited pool of skilled professionals, blockchain expertise and capabilities for both initial stage programming and blockchain operational development are relatively scarce worldwide. A World Economic Fo-

rum exploration reveals that over 40 central banks globally are experimenting with blockchain technology as of 2019 (Nikhilesh De).

In a paper by Gupta Abhishek (2018), he highlighted, Blockchain technology appears to be an advancement with the potential to significantly transform capital requirements and other financial services[4]. It is anticipated that in the future, blockchain will disrupt the financial industry."

Min Xu, Xingtong Chen, and Gang Kou (2019) conducted an analysis of 756 publications related to blockchain in the Web of Science Core Collection [9]. The study reveals that computer science is the most extensively researched topic. Within the realm of Business and Economics, the literature highlights significant milestones as commonly researched and searched topic over all the topics. The research underscores the substantial potential of blockchain technology to significantly benefit businesses. The paper suggests that researchers in blockchain technology should give heightened attention to privacy and security concerns. Despite the inherent anonymity and encryption in all blockchain transactions, there remains the possibility of data being accessed. In the security industry, there is a prevailing notion that absolute security is unattainable where there is physical contact. Therefore, addressing the challenge of altering sales data while preserving individual data privacy is deemed crucial for both academic study and practical implementation. Abdullah Al Hussain, Md. Akhtaruzzaman Emon, Toufiq Ahmed Tanna, Rasel Iqbal Emon, and Md. Mehedi Hassan Onik (2022) effectively summarized papers related to Blockchain technology in their exploration [8]. Through manual assessment, the authors categorized these publications into three primary disciplines and thirteen sub-domains. They have identified and released 70 papers related to Blockchain technology authored by individuals from Bangladesh based on their homegrown evaluation. This study indicates that the practical implementation of blockchain technology in Bangladesh has the potential to significantly enhance investment and hands-on experience in both commercial and Government sectors.

Boyu Liu, Xiameng Si, and Haiyan Kang (2022) aim to provide a comprehensive assessment and analysis of literature on blockchain-based operations in the supply chain [7]. The compilation includes the most recent relevant papers that are available for download. This study examines pertinent research from three perspectives: data security and access control, traceability and transparency, and sales performance. In the context of India, one notable use case of blockchain in supply chain management is the online Force Chain Management System for specifics (Aushada) in Karnataka. This system, integrated with blockchain, records transactions related to drug delivery from manufacturers to suppliers, warehouses, and eventually to hospitals, including quality examinations. Smart contracts ensure that non-standard specifics do not progress down the supply chain by providing checks and balances at each stage.

1.3. Objectives:

- To Study the background of cryptocurrency.

- To Understand the working of cryptocurrency.
- To evaluate it uses and future.

2.Bitcoin: Origin and Evolution

The world's first entirely peer- to- peer digital payment system, Bitcoin was developed in the wake of the 2007 – 2008 fiscal extremity by an unidentified inventor (or group of inventors) using the alias Satoshi Nakamoto (Nakamoto 2008, 1). Since the first bitcoin was issued in 2009, Bitcoin has constantly maintained the title of being the most precious cryptocurrency (Coingecko 2022). The conception behind Bitcoin was that it would operate also to real plutocrat or gold, but digitally, meaning that deals could be done directly between two parties and, if actors so asked, anonymously and untraceably. The fact that bitcoin deals are unrecoverable and endless is another pivotal characteristic.

The fact that checks can be fluently altered presents the biggest problem overall. Banks avoid this by espousing extremely secure systems that are challenging for outlanders to pierce, keeping the tally and bank accounts safe from manipulation. To make a distributed tally function, In the pre-digital period, all parties with clones of the tally had to be absolutely veracious and no way to commit any transactional crimes and discover a means of broadcasting each update to each deliverer of a tally. When the information age began and the internet came more popular, some of these issues might be resolved. Updates can be delivered to each side via the internet so that nearly any time they modernize their tally.

2.1 Blockchain

The Blockchain is a technology that is at **the heart of cryptocurrency innovation:** by putting in place computer programs for consensus, validity, and verification in a brand-new system called the blockchain. The blockchain infrastructure now includes compute components, opening up a vast array of opportunities beyond basic money transfers. These developments have a big impact on how Web 3.0 will develop. There are countless possibilities for creative uses.

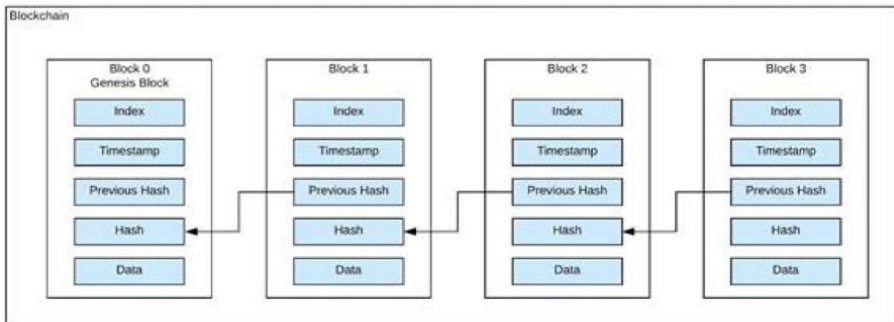


Fig.1 Blockchain

2.2 Blockchain Transaction Operation:

At the core of the Bitcoin Blockchain lies the transaction, serving as its foundational element. Transactions are broadcasted and validated, with multiple transactions constituting a block. These blocks form a chain connected by a digital data link. To determine the next block to be added to the chain, consensus procedures are applied to the blocks. The chosen block undergoes examination before integration into the existing chain. Specialized peer nodes, referred to as miners, execute the consensus and validation processes using robust machines running blockchain protocol software.

Transactions facilitate the transfer of value on the Bitcoin Blockchain, with defining the inputs and outputs. Once confirmed and algorithmically accepted by miners, a block becomes part of the Blockchain, contributing to the ongoing chain of blocks.

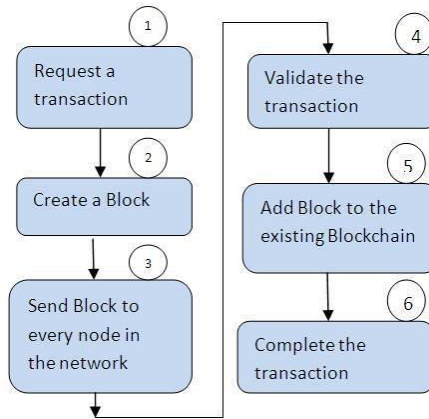


Fig 2. Transaction in Blockchain

2.3 In Digital Transformation role of Blockchain:

Blockchain is one of the leading technologies fueling innovation in India's technological landscape. Blockchain has gotten a lot of interest and adoption in the country during the last several years. Blockchain technology is being researched for its disruptive potential in industries ranging from banking and finance to telecommunications and beyond.

The integration of various technologies into our daily lives allows us to experience technology as a crucial component of the future. Technologies such as artificial intelligence, machine learning, and robotics are increasingly becoming worlds wanted technologies. Amidst these, blockchain technology has drawn significant attention in recent times. Initially developed in 2009 by Satoshi Nakamoto as the public

ledger for the Bitcoin network, blockchain has since found diverse applications across all industries globally.

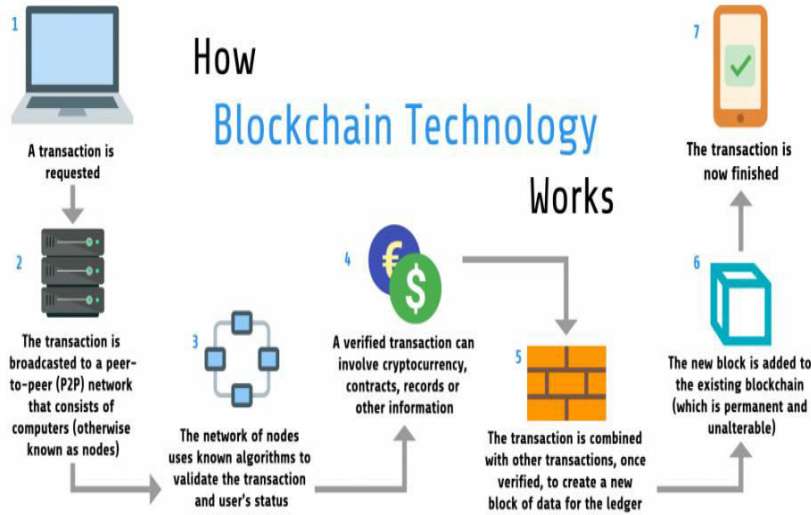


Fig.3 Working of Blockchain

Blockchain in financial inclusion:

Continuous Economic Development and removal of poverty are the basis of financial inclusion. This explains the relationship between needs of individuals and corporates with financial services & products available in the country. Especially in developing country It is “inventing financial services and promoting inclusion.” The issue of banking accessibility can now be override by the invent of Digital wallet. As a result many with no proper identification proof, not any requirement of maintaining balance can access global financial services like loan, saving accounts , insurance can be done using decentralized applications [4]. Now this makes expansion of financial services to small businesses and individuals who are often been either ignored or charged high by banks.

- **Blockchain in cross border remittances:**

One of the main applications of cryptocurrencies is remittances, which offer an affordable and practical means of making cross-border payments. Conversely, traditional transfer methods frequently struggle with exorbitant costs, sluggish processing, and unreliability. Cryptocurrencies have intervned in this situation by drastically lowering transaction costs and accelerating transactions [6].

These technologies provide a glimmer of hope to those who have been disregarded by conventional banking institutions for a long time by enabling decentralized lending, enabling safe digital identities, and facilitating remittances.

Future developments in financial inclusion initiatives could be expected as blockchain technology and cryptocurrencies continue to grow and change. No matter where they live or what their financial situation is, everyone will be able to access financial services thanks to this digital revolution. The dream of a society where everyone is financially included might ultimately come true if we continue to realize their potential.

- **Blockchain in Real Estate fields:**

Real estate transactions are typically costly, involve a lot of paperwork, and call for an agent's help. Through tokenization—the use of digital real estate tokens to represent physical assets—blockchain has the potential to streamline the real estate search and purchase process [10]. This would eliminate the requirement for an intermediary to facilitate transfers between buyers and sellers. The evidence of ownership will be available in a distributed digital ledger. This can be made manageable as real estate investments because a token can be divided similarly to a bitcoin. Boost market security and transparency as each transaction is handled and authorized by a third party.

Blockchain in Supply Chain:

Supply chains, which are the connections between the production of goods and the distribution of those goods, have always been subject to innovation [11]. Nowadays, supply chains are incredibly complex, spanning multiple continents, encompassing vast amounts of invoicing and payment data, involving countless parties, and potentially spanning months or even years. Blockchain is an appealing way to revolutionize supply chain and supply logistics. When goods move to a new stage in their supply chain, they can be recorded securely and forever, creating an unalterable, verifiable history from the point of purchase to the point of sale.

Blockchain in Health Care:

The nature of Bitcoin which is highly secure makes it an important factor to be used in healthcare sector. Patient vital information on their health can be stored in Database which cannot be corrupted using this technology. The access to this information can be provided only to doctors and patients [12].

Block chain in Telecom Industry:

Telecom Regulatory Authority of India (TRAI) has made the implementation of blockchain technology by all telecom firms. This move is expected to reduce unwanted potential fraud calls, with blockchain aiding in the identification of unidentified telemarketing companies by the authorities. Telecom businesses are optimistic that blockchain, coupled with artificial intelligence will address numerous flaws within the industry.

Block chain in Tea Board of India:

Tea Board is now ready to use blockchain technology to enhance traceability throughout the entire supply chain. The challenge of changing tea components due to adulteration has prompted the Tea Board to explore blockchain for improved monitoring. Implementing blockchain across the supply chain is expected to simplify tracking and enhancing accountability on the employees right from production to distribution.

Blockchain in Securities and Exchange Board of India (SEBI):

The Securities and Exchange Board of India (SEBI) has made a great move of making its users compulsorily to use the blockchain technology for all their activities. This program is expected to improve record-keeping transparency, monitor the formation of securities. Thus, making transactions and maintenance of files for future purpose in a effective way.

3. Conclusion:

Blockchain technology will undoubtedly change the game for India in the next years. Many of the crucial services offered by the government will benefit from a redesign and the elimination of all key issues. With rapid growth of technology and to upbeat the cons out of this, we need to open our minds to make the best use of the technology. Being open to take risk can bring us individually and as Nation to a higher level. In light of this, India is poised to advance to a completely new level in the future thanks to the adoption of blockchain technology, which will also help it significantly climb the global rankings.

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