Blockchain Role in Various Dimensions: An Overview

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Abstract:- In a blockchain, the blocks of information are connected in a chain to record transactions and track assets. The assets can be tangible (a house, cash, etc.) or intangible (intellectual property, patents, branding). Blocks in blockchain can store numerous types of data, such as the originator and recipient information when exchanging Bitcoin. Through blockchain, trustworthiness and visibility to data is achievable. It boosts the safety, effectiveness and trackability of data shared through a business network. Being decentralized, this system of information sharing is impossible to modify. Furthermore, records are unchangeable and certified by an impartial body. Blockchain, a novel technology, has now been utilized in the real estate sector. Governments and healthcare establishments have adopted this technology in order to make their contracts smarter.

Keywords:- Blockchain, Security, Online Sales and Business, Medical and Health Industry.

I. INTRODUCTION

With blockchain, a series of records that cannot be changed can be created. New records are added to a chain and linked together to form a chain. Blockchains were first introduced in 1991 to protect sensitive data from theft and revision. Each new block is identified by a hash and linked to the next. Bitcoin cryptocurrency is based on this technology. [1] Blockchain is a decentralized network that can help with verification, traceability and secure payments across multi-step transactions. In addition, it can reduce the costs associated with compliance and improve efficiency in data transfers. This technology also supports efficient contract management and product origin auditing; making it suitable for voting platforms, title and deed administration. By being decentralized and accessible to multiple individuals, blockchain makes it difficult for recorded data to be tampered with or altered. [1]

It can also be used in voting systems, contracts, and share management. Blockchain is a promising technology that can be useful in many industries and sectors. It has the following main features:[1]

- Blockchain is transparent by nature, and it has many benefits, including electronic voting. Blockchain is a transparent technology that has uses in diverse aspects of our society, such as secure electronic elections. Bitcoin is also a blockchain network that provides transparency. [2]

- Blockchain banks and services afford users more control over their finances, empowering them to manage their assets and records with no requirement for a central body. In stark contrast to traditional banking, where accounts may be blocked or funds seized for decisions made by the customer alone, blockchain technology enables freedom of uncensored monetary transactions. Ultimately, it is the user who has complete jurisdiction over their financial affairs. [2]

- In addition to being multifunctional, blockchain technology will not just be used in finance. Blockchain can be used in a wide range of sectors and markets, including commercial finance, banking, government, healthcare, education, and more. These are all sectors that keep our society running. [3]

- A blockchain is a centralized system that provides better security, typically for financial data. Blockchain uses an intricate form of cryptography to ensure that the data in the system is secure. By incorporating cryptography and decentralization, blockchains provide users with a layer of security that surpasses conventional databases or existing systems. [3]

- Blockchain technology has a lot of advantages compared to other technologies. Its decentralised nature allows it to bypass the need for middlemen, leading to cheaper and more efficient operations. It's popular due to its effective supply chain creation, saving on paperwork and associated costs like lawyers fees and emoluments. We are working hard to create a feasible solution which will dramatically decrease the amount of time needed for clearance processes.[4]

II. BLOCKCHAIN IN ONLINE BUSINESS

In addition to Bitcoin, ecommerce brands can use Ethereum for their own blockchain technology. Ethereum is one of the most popular blockchain technologies used in ecommerce. Blockchain provides a range of advantages that are beneficial to all involved in financial transactions. This includes increased security, reduced costs, accelerated speed and improved customer experience. With blockchain, the need for third-party intermediaries is removed and transactions become instantaneous, meaning merchants will be paid immediately after orders are processed. Furthermore, blockchains can store not only transactional data but also smart contracts used to automate tasks. [5]

Here are some examples of work in the Ecommerce Industry:

A. K. Shrestha, et al. 2020, proposed a novel e-commerce platform leveraging blockchain technology to facilitate the connection between customers and merchants while enabling them to share personal info without losing ownership over it; such an initiative could be used in shopping cart transactions. This model featured four distinctive aspects: Firstly, it ensured privacy since no one would be able to access payment details; secondly, user confidentiality was preserved as system changes were precluded; thirdly, consumers were rewarded for contributing data to the network. The evidence of all transactions on the MultiChain network are immutable, allowing for effective tracking and rewards when data is shared with other companies. A digital platform that covers cryptocurrencies, MultiChain compiles profiles in an open data format and publishes them on a public stream in the blockchain. Smart contracts then verify and enact the agreed terms of use, awarding customers with digital tokens. The fact that unanimity is required increases trust and loyalty; thus, establishing trustworthiness among the participants. [6]

Ometov et al. 2020 discussed how blockchain is infiltrating different aspects of modern Information and Communications Technology. Most machinery used to support its operations are designated as miners, while wearables and mobile devices may be integrated into eCommerce when they are charging. Moreover, the paper evaluates the potential utilization of multiple limited-capacity gadgets in order to facilitate a reduced power consumption blockchain system. Mobile blockchain projects can offer enhanced system efficiency and attract more users to the system. We can now use our phones as nodes and access applications with the help of these platforms. These employ a new consensus protocol that integrates Proof-of-Work, Proof-of-Activity, and Proof-of-Stake algorithms. To finish with, a testnet was setup consisting of more than two thousand smartphones for comparison purposes between different projects in terms of user experience. It was found that using PoA does not significantly drain battery lifetime. Additionally, PoA has less negative impact than PoW for this task. Also, there are some open problems and future directions that need to be considered.[7]

Pushpalatha et al. (2022) present Onkart, a blockchain-based platform for e-commerce transactions that removes the need for third parties. When an order is placed, both the seller and buyer make deposits on the platform, to guarantee an honest transaction. If the agreement is satisfied, then the sellers and buyers receive their respective tokens. This incentive structure creates a secure environment powered by blockchain technology, adding efficiency and enforcement of contracts. To further emphasise its effectiveness in decentralized e-commerce, studies address latency, throughput and other measures of security. With more banks transitioning to digital formats comes certain challenges such as security concerns and loss of jobs; however, these can be remedied by increased customer convenience.[8]

Table 1. Online Businesses Related Researches

Author Names	Paper Title	Technology	Concept
"A. K. Shrestha, et al. 2020	Customer Data Sharing Platform: A Blockchain-Based Shopping Cart	Blockchain	Framework for a shopping cart as one of the enterprise nodes of MultiChain for users' profile data
A. Ometov et al. 2020	An Overview on Blockchain for Smartphones: State-of-the-Art, Consensus, Implementation, Challenges and Future Trends	Blockchain , Android	Novel consensus protocol based on a combination of Proof-of-Work (PoW), Proof-of-Activity (PoA), and Proof-of-Stake (PoS) algorithms for efficient and on-the-fly utilization on resource-constrained devices
A. Pushpalatha et al. 2022	A Trustworthy Decentralized Onkart Ecommerce Platform based on Blockchain Technology	Blockchain	Consensus based Blockchain network and Smart Contracts"

III. BLOCKCHAIN IN FINANCE AND BANKING

E-commerce has significantly broadened Indian customers' access. This has enabled new business opportunities, further boosting the country's GDP. [9] Electronic banking is used to carry out virtual banking activities on the internet securely. It covers services related to finance, banking and insurance as well as stock broking and payment gateways. [10] Banks also offer mutual funds and other services. By embracing Information Technology, banks can reduce costs of operations, promote ease of maintenance and become more competitive. Thus, E-banking is a necessity for new banks entering the market. [10]

Research in Banking Sector,

N. R. Bagrecha, et al. (2020) explored how modern advances in banking can go beyond the traditional framework. Blockchain, a distributed ledger platform, has been influential in leading this transformation by providing its key attributes such as atomicity, transparency, robustness and auditability to a range of institutions and banks. This paper strives to demonstrate how these features can be utilized to build a decentralized banking system while also tackling any potential difficulties that may arise along the way. [11]

S. Joseph and S. Karunan, (2021), Blockchain technology has the potential to revolutionize processes in banking, allowing for democratic, transparent, secure and efficient operations. This is especially true in the Indian

banking system, one of the world's major systems which follows a complicated payment system based on real-time gross settlement that is centralized. The traditional setup unfortunately does not provide sufficient security measures or decentralization in lending, leading to slow processing speeds and potential data breaches. Such issues could be solved through harnessing the disruptive power of blockchain as it ensures a higher level of security along with decentralization. [12]

J. Han, (2021), Businesses can improve their management level and improve their performance with a data management system for commercial banks. Data about bank accounts is processed and stored securely in a blockchain. Based on the integrated data management and performance combined blockchain model, this paper focuses on developing software for a commercial bank management accounting system. [13]

Table 2. Related Researches in Financial Sector and Banking

Author Names	Paper Title	Technology	Concept
"N. R. Bagrecha et al. 2020	Decentralised Blockchain Technology: Application in Banking Sector	Blockchain , Android	Distributed banking system using blockchain
S. Joseph and S. Karunan, 2021	A Blockchain Based Decentralized Transaction Settlement System in Banking Sector	Blockchain	Decentralized Banking system and services based on Ethereum blockchain platform.
J. Han, 2021	Intelligent Data Management System and Performance Joint Blockchain Model for Commercial Bank Management Accounting	Blockchain	Commercial bank management accounting system based on the intelligent data management and performance combined blockchain model".

IV.　　BLOCKCHAIN IN MEDICINE AND HEALTH

Blockchain networks can help healthcare systems to exchange medical data of patients, preventing dangerous mistakes in the field due to its accuracy. This transition to a value-based model provides doctors with crypto-payments for their services, as opposed to being reimbursed just for the quantity. [14] Through Blockchain, secure data is stored and shared among several patients which helps with health management, minimizing security and cost risks. Furthermore, Blockchains' characteristic of not allowing any changes or losses in data makes them more reliable than centralized systems. Healthcare Industry work includes the following: [15]

M. J. J. Gul et al. (2020) proposed applying Machine Learning concepts to tasks carried out in blockchain management systems, such as using agents to handle healthcare blockchain tasks. The evolution of this technology has continued over the last year and automation is being implemented to better secure it, while machine learning is integrated with it to automate various tasks within a healthcare setting. Reinforcement Learning is applied to train an agent for transaction verification, consensus building, block security, and network protection. Additionally, Machine Learning allows for efficient data storage and access. [16]

W. Bodeis and G. P. Corser,(2021) conducted a review of recent studies examining the implementation and incorporation of blockchain into healthcare systems. After evaluating relevant literature, the authors concluded that adoption rates remain unchanged across multiple industries. They also recommended further research on these two elements for greater understanding of existing systems and possible improvements. In conclusion, this brief literature review has revealed an abundance of research dedicated to blockchain adoption; however, more investigation is needed on integrating this technology into healthcare systems. [17]

Table 3. Related Researches in Medicine and Health

Author Names	Paper Title	Technology	Concept
"M. J. J. Gul, et al. 2020	M. J. J. Gul, et al. 2020	Blockchain , Artificial Intelligence	Reinforcement learning is used in this study to automate blockchain tasks with multiagents
W. Bodeis and G. P. Corser,2021	Blockchain Adoption, Implementation and Integration in Healthcare Application Systems	Blockchain	Blockchain implementation and integration for healthcare systems.
Hitesh Kumar Sharma et al. 2022	Intelligent Data Management System and Performance Joint Blockchain Model for Commercial Bank Management Accounting	Blockchain	Electronic healthcare records (EHR) using Blockchain"

V. CONCLUSION

Data transfer can be accelerated and secure with blockchain. In addition to verifying transactions that require multiple steps, blockchain can also help with contract management and auditing the origin of products. Blockchains are designed to allow digital information to be stored, distributed, but not altered. Thus, blockchains are the foundation for immutable ledgers, or records that cannot be altered, deleted, or destroyed. Data can be collected, stored and distributed using blockchain applications with protections against fraud and unauthorized activity. Data is always stored in an encrypted format, making it difficult for hackers to view it. In today's world, blockchain technology is becoming increasingly important, and its distributed nature enhances its security and importance to all sectors.

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