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Applications of Blockchain Technology and Crypto Currencies: Current Practice and Future Trends

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Abstract: A type of machine learning technique known as convolutional neural networks (CNNs) has demonstrated great performance in recognizing patterns and traits in medical images, including CT scans. These algorithms can develop a very accurate ability to distinguish between benign and malignant lung lesions by receiving training on massive datasets of annotated CT images. Additionally, CAD systems that have been combined with machine learning models can help radiologists analyze CT images. This paper explores the applications of blockchain technology and cryptocurrencies, examining their current practices and future trends. An overview of blockchain technology, explaining its decentralized and transparent nature, as well as its underlying mechanisms such as consensus algorithms and smart contracts is provided. Furthermore, the paper discusses the regulatory landscape surrounding blockchain technology and cryptocurrencies, highlighting the efforts made by governments and international organizations to establish frameworks and guidelines. It also addresses the challenges and concerns associated with scalability, energy consumption, privacy, and security in the blockchain and cryptocurrency ecosystem.

Keywords: *Crypto Currencies, Digital currencies, Virtual currencies, Cryptography Secure financial transactions, Decentralized networks, Blockchains*

Introduction

A novel and exhilarating echnology known as the Blockchain has the potential to greatly improve society by lowering the risk of theft and fraud while also introducing unprecedented levels of transparency. While blockchain technology was first linked to digital currencies and NFTs in the 2010s, it has now developed into a management solution for a wide range of worldwide enterprises. Although blockchain technology was initially associated with digital currencies and NFTs in the 2010s, it has since evolved into a management solution for a wide range of enterprises worldwide. Blockchain technology has the potential to revolutionize the way we store and share personal information, as well as impact the food and gaming industries. By using blockchain technology, also known as distributed ledger technology (DLT), digital information and cryptocurrencies (such as Bitcoin) can be transferred directly from one user to another without the need for a trusted third party. Blockchain technology allows for the simultaneous verification of a transaction by multiple network nodes, and anyone with access to a computer can join the network and help verify financial transactions. Once verified, the transaction is then saved as a code block on numerous devices. To prevent hacking, the DLT keeps a record of past transactions by adding them to a chain (hence

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blockchain). The appeal of blockchain technology lies in its ability to offer a secure way of transmitting data without the need for a third party [1]. Blockchain technology is not limited to monetary exchanges; it has a wide range of potential applications and can be used in other fields as well. As a result, many different sectors are utilizing blockchain technology.

Energy, transportation, and education are just a few examples. Although blockchain is still a young technology, it has a rich and intriguing background. The next part will focus on the most significant moments in the history of blockchain technology. Proof-of-work blockchains may be traced back to 1991, when Stuart Haber and Wakefield Scott Stornetta first proposed the idea of a secure digital chain of documentation. For the next two decades, the technology flourished and spread. In 2008, the year that Satoshi Nakamoto produced a working model and first implementations for blockchain technology, the technology began its breakthrough year. Once the first blockchain and cryptocurrency were released in 2009, its effect on the IT industry started showing. [2].

The cryptocurrency was created by Satoshi Nakamoto in 2008 [1], also known as Bitcoin, a revolutionary new kind of digital currency and method for monetary exchange.

To create a currency that can function without the intervention of middlemen in the same way that fiat money operates today, a peer-to-peer (P2P) network must be established [2]. Due to its decentralised nature, and blockchain has the potential to cause widespread disruption across industries via the automation of processes and the reduction of associated costs. Blockchain technology has numerous benefits, but it also has several downsides [3, 4]. This opens the door to a large variety of novel uses across many disciplines [5].

Distributed public ledgers, like blockchains, which are copied across a network of computers so that everyone can see the data, are becoming more popular. The distributed network of identical databases makes it easy to add or remove nodes to keep the network running smoothly in the face of partial system failure or breakdown [6]. With a blockchain, data blocks are linked together to build an incorruptible chronological record. There has to be agreement on the best way to ensure the validity of these database entries

Several analysts have opined that the key advantages of blockchain technology make it a realistic technological possibility. Transparency is one of these characteristics. In a blockchain, everyone may potentially see every single transaction and piece of data. This makes the technology ideal for applications like monitoring and reporting data back for confirmation.[7-8] The immutability of the information stored in a Blockchain makes it invaluable. It is possible to alter data after it has been recorded in a blockchain, but this process requires verification and always leaves a trail [9].

Moreover, blockchain technology's capacity for authentication and identity maintenance are two additional benefits. The Blockchain is a distributed ledger that allows all participants to observe and verify the status of all other participants' transactions. Due to the nature of blockchains, it is not necessarily the case that a user's identity will be accessible to the public. There is the potential for production. The Bitcoin network continually generates new sets of public and private keys. Often, just a person's public key is needed to identify them. With the exception of situations when a significant time and monetary commitment is necessary, cryptocurrencies demonstrate that blockchain technology is appropriate for maintaining users' privacy [10].

One of the most fascinating applications of blockchain technology is the potential it has for enabling completely secure monetary transactions, which is now under development. There is no need for trust between participants in a Blockchain transaction because of the way the technology was built [11].

There is no denying that digital technology has made businesses more efficient and competitive, increased the possibility for growth via the use of digital payment systems, and facilitated more interaction between market participants through networking.

Despite their rapid adoption in many industries, digital technologies' potential, benefits, and drawbacks are little understood. Blockchain technology streamlines transactions in financial institutions, but academics and practitioners are still debating its pros and cons. Thus, the present status of blockchain technology and the features and potential uses of blockchain-based firms in different economic and financial sectors must be assessed.

Users may adjust their private keys and employ encryption to limit Block chain access to certain data. Encryption lets users access several copies of a distributed chain of blocks at once. Database-level security safeguards data in blockchain technology. By using a distributed, time-stamped server and peer-to-peer network connection, blockchain technology helps to safeguard financial transactions against fraudulent or unauthorised alteration. For this reason, the database is not controlled by any central authority and is managed separately. As a consequence, blockchain technology provides a secure, decentralised, and highly scalable foundation for recording events (like bank client data). This means that the Blockchain is a system made up of many interconnected parts. Everyone has an interest in the system's reliability and proper operation [12].

In the corporate realm, blockchain technology might do away with the need for middlemen altogether. There is no longer a need for users to go via centrally controlled companies that have a monopoly on the electricity supply market in order to recoup the costs associated with selling their surplus electricity to other customers. The banking industry looks to be the most potential area adopting blockchain technology [13]. While processing payments on the Blockchain, it is vital to understand as little as possible about the payer, such as whether or not he has enough money in his account. Before a mortgage agreement can be signed, information about the borrower's income, assets, and credit history must be gathered. [14].

By bringing together big financial institutions and government entities, we can create the framework required to investigate the fundamentals of blockchain technology and reap its potential advantages.

As a result, the R3 consortium was established to push Blockchain technology forward. Goldman Sachs, JP Morgan, Credit Suisse, and Barclays, among others, participated in the deal. By the year's conclusion, more than a dozen of the world's largest banks had joined the partnership. Financial institutions are looking at blockchain as a way to cut or eliminate expenses [9].

That's why the R3 consortium has resolved to conduct a comprehensive study of the present monetary system in order to pinpoint the most potential uses for blockchain technology in future. It is the opinion of experts in the databases built on the blockchain platform that data on payments and foreign exchange transactions, credit and factoring operations, and other financial education may be included.

In a broad variety of settings, blockchain technology may be used at one of three distinct levels. The best products and services are those that really enhance the lives of their users. The abilities acquired at the intermediate level provide the groundwork for the advanced material. That's how far we've come in terms of research and development. The three fundamental supports are a conducive regulatory environment, adequate physical facilities, and skilled workers. This is the only level of the company where new digital technologies may be effectively integrated and changed[15].

Literature Review

The fundamental components of every Blockchain system are the consensus algorithms. The strength and efficiency of any Blockchain are dependent on these algorithms. Proof-of-Work, initially employed in Bitcoin, is the most widely utilised consensus algorithm. Many consensus methods have been suggested since then. The article [1] provides a high-level introduction to Blockchain technology and the most well-known Blockchain-based cryptocurrencies.

In paper [2] CryptoNote is a blockchain system designed with anonymity in mind. Presently, there are more than ten distinct cryptocurrencies that have been constructed using the CryptoNote system. One of the most well-known of them is Monero, which has a yearly average market valuation of 2 billion USD. By include dummy inputs in a transaction, CryptoNote makes it harder to trace its origin to its final result. Privacy in blockchains that are designed after CryptoNote is significantly compromised by the probabilistic attacks that we proposed in this work. In this work in-depth study of the suggested assaults and calculated their mistake rates.

In order to function, cryptocurrencies like bitcoin rely on decentralised ledger technologies like the blockchain. Many have claimed that blockchain is hack-proof, however recent events have shown that this is not the case. Khangura and Arora analysed several forms of cybercrime [3]. Criminals find attacks against cryptocurrencies more appealing since recovering stolen assets is a cumbersome process. This study provided a comprehensive overview of five distinct types of bitcoin assaults,

as well as an analysis of many popular consensus methods. Although blockchain is undoubtedly cutting-edge, its flaws have already created problems in the past and must be taken into account.

The paper [4] speculates that if the network were to fall apart, blockchain-based coins may still operate. The consensus problem for partition able blockchains is defined. An intriguing solution to the problem may be found if the partitions could proceed independently via the division of accounts. This study demonstrated that the asynchronous system is inadequate to address the problem at hand. It's conceivable that nodes on the two parts of the network won't agree on which side started executing concurrent work first or when the last block was mined jointly.

As per [5] Proof-of-Work (PoW) is a distributed consensus technique that makes blockchain technology viable. They created a proof-of-work peer-to-peer emulator as part of their investigation of permission less blockchain networks. The simulator can generate random numbers for use in simulations, has a simple user interface, can be easily visualised, can be controlled and customised dynamically and programmatically, and can generate data from simulations for further study. Researchers advocated using their simulator for early testing and scalability research in the fields of blockchain and P2P networking and making it freely accessible to the research community. To demonstrate its capabilities, researchers used the simulator to try out the newest discoveries in blockchain security research, such as resistance to 51% assaults, eclipses, partitions, and denial-of-service attacks.

Digital signatures based on public-key cryptography protect the transactions in blockchain-based decentralised digital currency systems **[6**]. In particular, public-key cryptography techniques like ECDSA that are used to create digital signatures are susceptible to quantum assaults. This Study examined how resistant modern cryptocurrency blockchains are to quantum assaults. Several of the strategies suggested to secure blockchains in the Quantum Age are also discussed. It also details many post-quantum digital signature systems that may be implemented into blockchains to make them immune to quantum computing attacks. Based on the findings of this research, it is clear that the vast majority of cryptocurrencies now in use are susceptible to quantum assaults, leaving more than 99.8 percent of the overall cryptocurrency market value at danger. The research concluded with several useful suggestions.

The paper [7] provides all factors and resources with research and practical experience on Blockchain technology and implication in practice, as well as subjective exploration of possible business and IT cases.

According to the source [8], a blockchain is a decentralized system for transactions that enables fast and secure payments without the need for centralized management. It stores data in a tamper-proof manner, making it extremely difficult to hack or cheat. This technology, which is also known as distributed ledger technology (DLT), uses a cryptographic signature called a hash to record transactions.

The blockchain is said to provide a number of benefits in paper [9], including distributed systems, security, and trustless architecture. Numerous blockchain applications exist, including cross-border protection for cryptographic money transfers, government and social government aid Internet of Things (loT), budgetary administrations, change management, and government.

There are a few publications that discuss the use of blockchain technology in various industries and usage aspects, but there is no systematic analysis of blockchain technology from both a specialist and business perspective. A detailed review of advancements in blockchain technology has been done to fill this gap. This article would explicitly explain the use of blockchain to multiple experts, its implementations, and new challenges as well as ongoing developments in overcoming the challenges.

Cryptocurrencies and Blockchain Technology

Cryptocurrencies are a kind of digital currency that is increasingly being used in everyday transactions like online banking and shopping. The Bitcoin transaction ledger is built on a technology called blockchain. In this part, we'll go over what Blockchain is, how it works, and how it differs from conventional databases, as well as its basic principles, architecture, major features, and operating principle. Cryptocurrency is a kind of digital currency that is secured via the use of encryption. Blockchain, a public distributed ledger, is used to record transactions between users, making it a decentralized system. There are digital

marketplaces where cryptocurrencies may be traded for traditional currency [5]. They fluctuate in value in relation to the US dollar, the British pound, and the European euro.

The Blockchain is the central database of a digital currency, which keeps track of all transactions, activity, and ownership details. Every node in the software network that supports a cryptocurrency, known as a miner, keeps a copy of the Blockchain. In order to validate transactions and create new blocks, miners use cryptographic operations. There is no turning back after a block has been put to the Blockchain and the chain has been established. Each owner of a cryptocurrency has a unique private key that may be used for identity verification and making trades. All cryptocurrency transactions in a network are recorded in a distributed ledger called a Blockchain. To put it another way, it is a network's authoritative source. A blockchain is a series of linked data packets. Several transactions are grouped together to form a block. The initial block is termed the genesis block

• The preceding block's hash, or the parent block's hash. The value that is one of a kind and adapts to new chain blocks

• A nonce is a random integer used to confirm the hash. Several computers, or nodes, in a Blockchain network maintain a replicated copy of the distributed ledger. The Blockchain is added when enough nodes agree to do so via communication. Getting to this point of agreement is known as building consensus. The distributed ledger gets its name because each node in the network simultaneously stores a copy of the ledger and updates it whenever a new chain is added. After a transaction has been recorded on the Blockchain, it cannot be altered or deleted. In other words, it can't be changed in any way. Both permissioned and permission-less approaches may be used to determine who has the privilege to conduct transactions on a Blockchain. Permissioned Blockchains restrict access to just those users who have been accepted into the network. With a permissionless Blockchain, anybody may make a purchase, but they have to do so independently. Because of the distributed ledger structure, Blockchain may continue functioning in the event of a failed node. There will be more faith in the system as a result of this. Due to the removal of middlemen, data security is improved in Blockchain design.

Hash is a one-of-a-kind number computed by a mathematical function on a string of text. In addition to hash algorithms, another technique known as proof-of-work is utilised to prevent fraud and strengthen the integrity of Blockchain. The term "proof-of-work" (PoW) refers to a technique for producing data that is challenging to produce but simple for others to verify. Miners need to resolve a proof-of-work (PoW) problem before the network can accept a block. A fresh chain is added to the block and Proof-of-work (PoW) computations are performed every 10 minutes, on average As a user, one have the option to store your cryptocurrency in a digital wallet called a blockchain wallet. This wallet has a unique ID that belongs only a single person. There are two parts to a wallet: the public key, which serves as an address, and the private key, which serves as a secret. To make sure that your financial dealings are secure, a wallet will provide public and private keys.

Anyone can send a transaction to the recipient's address by using the public key. The private key for the wallet is only accessible by the owner, who can access its contents. A recently developed technology called blockchain integrates three separate technologies: private key cryptography, a distributed network with a shared ledger, and a financial incentive for handling the network's transactions and record-keeping. In the blockchain, public and private cryptographic keys collaborate to create an identity.

Together, these two keys produce a strong digital signature that can be trusted to demonstrate ownership. Blocks are produced by the miners, who also handle financial transactions, and they are broadcast to all nodes. The block is added by the nodes to the Blockchain after Proof-of-Work (PoW) validation, which updates the ledger. The nodes or miners are compensated for completing these activities with cryptocurrency that is added to their online wallet. The checkout procedure includes additional payment gateways. They do an examination against the Blockchain in order to verify claims.

“Blockchain-powered Multi-Cryptocurrency Payment Gateway: Unifying Digital Transactions”

A multi-cryptocurrency payment gateway is a platform that allows businesses to accept multiple cryptocurrencies as a form of payment. It acts as an

intermediary between the customer and the business, facilitating secure and seamless transactions. This payment gateway leverages blockchain technology to ensure transparency, immutability, and security in processing these cryptocurrency payments. Additionally, it enables businesses to tap into the growing popularity of cryptocurrencies and expand their customer base by offering a wider range of payment options. Certain Blockchain-based payment gateways, such as ErosCoin, provide a whole ecosystem in addition to simple transaction processing. Smart contracts may also be made with the use of payment gateways. Eroscoin also offers an in-chat payment function and free P2P bulk payments. More than 500 different cryptocurrencies are accepted by these Blockchain payment gateways like ErosCoin. The gateway also provides further advantages of speed, efficiency, and reduced expenditures. The transaction time for global payments is 15–20 seconds, compared to the 3–4 days required by a standard payment gateway. With the help of the multi-cryptocurrency acceptance platform, users no longer have to use individual programmes for each cryptocurrency they want to use.

Blockchain-based Cryptocurrency Transactions

The widespread use of cryptocurrencies has sped up and reduced the cost of cross-border financial dealings. A cryptocurrency wallet is required for any cryptocurrency transactions. In addition, a Point-of-Sale (PoS) terminal may be used. The payment processing system is linked to the merchant account.

A crypto currency wallet is a piece of software that can store a user's public and private keys and communicate with different blockchains. This digital wallet just stores keys or addresses, and not actual currency as a conventional wallet would. When someone gives you some digital money, they are effectively transferring the coins they sent to the recipient's wallet address. The money is sent to the public key address provided by the receiver. The recipient's private key must correspond with the sender's public address in order for the cash to be released from the sender's wallet. If they are the same, then the sender's wallet balance will be reduced and the recipient's will be increased. Coins are not being traded for anything of value. On the Blockchain, a new "block" or record of transactions is generated.

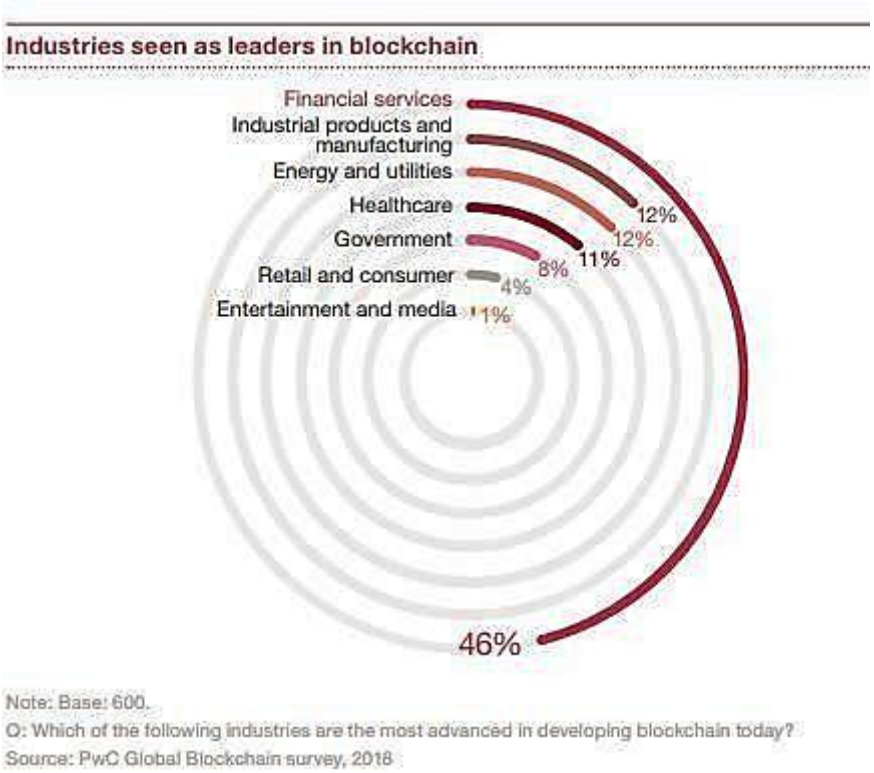

Fig 1. Industries Seen As Leaders in Block chain

Table 1: Categories of Blockchains [Guo & Liang, 2016]

	Public Blockchain	*ConsortiumBlockchain*	*Private*
Persons Participating	Anybody	Definite groups	Centralized
Credit System	Mechanisms of Consensus	Unanimous agreement	Self-endorsement
Bookkeeper	All participants	Participants decide	Self-determined
Incentive	Required	Optional	Not needed
Advantage	Self-establishedcredit	Efficiency and cost optimization	Transparency and traceability
Application	Bitcoin	Clearing	Audits
Load capacity	30-20 times/second	1000-10000 times/second	Varies

Since there is no centralised authority controlling Bitcoin and comparable blockchains, and because of the built-in encryption, users may remain anonymous while still benefiting from the system's security and verifiability as shown in Figure 1. If a blockchain is public, private, or hybrid, together with other operational design considerations (Refer to Table 1**)**, determines the degree to which users' data is private or transparent.

The Uses of Blockchain Technology and Their Justification

In the next part, we'll go through some of the most significant uses for blockchain and the primary impetus for adopting it. The volume of transactions in distributed ledger applications may be handled by blockchain networks. High transaction execution necessitates complex data processing services, making them important for scalable blockchain applications. As cloud infrastructure can easily scale, it might be used to provide on-demand computing resources for blockchain applications. As a result, employing both cloud computing and the blockchain to build an integrated system that is highly scalable.

Blockchains frequently struggle with handling a high number of users. The two biggest blockchain protocols, Bitcoin and Ethereum, had moderate exchange values and elevated exchange expenses as a result of the sharp increase in users. This fact has led to extensive research on how to make both these systems and blockchains more equitable, although opinions on the best course of action are very divided. It's going to take a long time to wrap up. In addition, before applying a scaling approach to a record, it should be validated and tested extensively. In order for the blockchain to gain widespread acceptance, it will be necessary to put to rest fears about its adaptability. The absence of transaction fees is IOTA's primary benefit over competing crypto currencies. Unlike other crypto currencies, IOTA won't have to worry about scaling because to its innovative technology

1. The Price of Lowering Data Breach Rates

The cost of a data breach could be reduced with the help of blockchain technology. If companies can avoid data breaches, they might be able to save money on things like legal bills, recovery of data, productivity losses, and interruption of business insurance. At many companies, spending on data protection and security exceeds 20% of the total IT budget. Malware causes a significant portion of these expenditures, usually about $2.4 million annually [9]. Also, fixing the impacted systems will take a considerable amount of time. According to IBM, the yearly cost of data breaches has increased by 12% over the previous five years to $3.2 million [9].

2. Cross-Border Remittance Growth and Cost-Reduction of Trans-Border Transactions

Financial institutions and other enterprises have a serious problem with the high cost of international transactions. Frequently, it takes models at least three days to finish these transactions. To get past these restrictions, businesses like Ripple are now utilizing cryptocurrencies and blockchain technology. Over 40 countries on six continents already use the Ripple network. International financial transactions can now be completed quickly, affordably, and in close to real-time thanks to blockchain technology [10].

3. Governments are protecting citizenship data using blockchain technology.

Governments are also utilizing blockchain for the maintenance of digital identities. In Estonia, digital identification that utilizes blockchain technology is being used to update national identification records, safeguard citizen data, and reduce the high costs related to outdated digital ID management systems [11].

4. Blockchain Technology for Copyright Protection

The blockchain is being used by a number of new businesses to safeguard their clients' intellectual property. Whenever a customer registers their work on the site, they have the option to prevent it from being utilised without their consent. If a certificate holder discovers that their platform has been infringed, they may file a lawsuit for an injunction. Blockchain technology and AI are used by companies like BlockAI and Copyrobo to let artists instantly secure their online works [11][12]. A copyright certificate may be obtained by creating a timestamp or fingerprint on the blockchain. These mediums are crucial for the protection of copyright.

Future of Blockchain in Cryptocurrencies

There will be a significant increase in the value of all worldwide transactions to over $39 trillion by 2022 [9]. International trade, borderless e-commerce, cross-border B2C payments, and the rise of online businesses have all played a significant role in this growth. Blockchain is expected to rise to prominence in the field of international money transfers because to its use of encrypted distributed ledgers, which enable the verification of transactions in real time without the need for intermediaries like correspondent banks. The verification procedure does not depend on any external sources, and some banks in Japan and Korea have already started using this technology for payment operations. Blockchain technology is having a profound impact on the ways in which accountants, beneficiaries, and consumers interact with international monetary transfers.

1. Smart Contracts

Blockchain technology's use in facilitating smart contracts has garnered a lot of attention. These agreements are computer code that is kept on a Blockchain and activates when certain criteria are satisfied. They may carry out their own terms and enforce their own validity with no third party or delay. After an activity has been completed, the Blockchain is updated; this information is immutable and accessible only to those who have been granted access. Workflows may also be programmed to automatically perform these steps when certain criteria are fulfilled. These resources provide an automated, more secure, and less time-consuming alternative to conventional contract law.

2. Identity Management

Since the turn of the century, protecting one's identity has been of paramount importance. Blockchain and identity management have several potential uses. Blockchain technology might be used to keep track of voters and guarantee a fair election, for instance. In addition, it may facilitate the safe and effective transmission of user data across different systems and platforms. Real estate ownership, titles, and other related documents are all greatly aided by this technological advancement.

Moreover, we all have to manage many online accounts and passwords in addition to our passports, licences, insurance, and other official papers, and there are countless opportunities for online theft of these identities. Blockchain's decentralised verification methods ensure these identities are safe and allow for anyone to establish their own sense of sovereignty over their own identification.

In order to authenticate their identity, users may provide their self-sovereign ID, which fully removes the need for passwords and returns identity management power to the user. This potentially revolutionary technology is still in its infancy, with specialists still fleshing out the specifics that it would need to establish a truly independent form of identification.

3. Manufacturing and Distribution of Vaccines and Medicines

IBM's use of Block chain technology in a 2022 pilot project for COVID management is an example of this movement at large [9]. The head honcho has created a mechanism for coordinating the several agencies and healthcare authorities responsible for vaccination distribution. Blockchain is utilised to consolidate data on vaccination rates and programme efficacy from many sources, including government and private healthcare databases.

Vaccine batches with disproportionately high adverse effects may be isolated with the use of Blockchain technology. Several more examples like this emerged in 2022, with a primary emphasis on vaccine production, distribution, and monitoring.

Several of the 2022 Blockchain developments would undoubtedly shine a focus on their potential applications in light of the pandemic or its impacts. To a similar extent, it's not shocking that the advantages of blockchain technology are luring more corporations and government agencies throughout the globe to increase their financial commitment to it.

Regulatory Efforts: Establishing Frameworks for Blockchain and Cryptocurrencies

The regulatory landscape surrounding blockchain technology and cryptocurrencies has been evolving rapidly in recent years as governments and international organizations seek to establish frameworks and guidelines. The unique characteristics of blockchain and cryptocurrencies, such as decentralization, anonymity, and cross-border nature, have presented both opportunities and challenges for regulators worldwide. Various efforts have been made by different countries in this regard. Initial Coin Offerings (ICOs) have been closely watched by the Securities and Exchange Commission (SEC) in the US to ensure compliance with securities laws. Additionally, various regulatory bodies have established guidelines for the use of cryptocurrencies, including the Financial Crimes Enforcement Network (FinCEN) and the Commodity Futures Trading Commission (CFTC) [16]. Similarly, the European Union has been working towards establishing a comprehensive regulatory framework for cryptocurrencies and blockchain technology. Virtual asset service providers are required by the EU's Fifth Anti-Money Laundering Directive (AMLD5) to adhere to anti-money laundering (AML) and know-your-customer (KYC) laws. The EU is also working to create the Markets in Crypto-Assets (MiCA) law to give crypto assets legal certainty and consumer protection [17]. Asian nations have also expressed a strong interest in regulating blockchain technology and cryptocurrencies. For instance, Japan developed a regulatory structure for cryptocurrency exchanges and was one of the first nations to accept Bitcoin as a legitimate payment mechanism [18]. South Korea has implemented regulations to combat money laundering and illegal activities associated with cryptocurrencies [19]. China has taken a more restrictive approach, banning initial coin offerings and cracking down on cryptocurrency exchanges [20]. In order to fight money laundering and terrorist funding, international organizations like the Financial Action Task Force (FATF) and the International Organization of Securities Commissions (IOSCO) have provided guidelines on AML and KYC methods in the cryptocurrency arena. IOSCO has published reports on ICO risks and provided guidance to member countries. G20 and G7 forums have recognized the need for regulatory approaches to cryptocurrencies, discussing topics like AML, consumer protection, and market integrity [21-24]. In conclusion, while approaches may vary across jurisdictions, efforts are being made to establish frameworks and guidelines that balance innovation with regulatory oversight in the rapidly evolving landscape of blockchain and cryptocurrencies.

Conclusion

Blockchain is the latest technology that emphasises the concepts of the "Internet of Things," "icollaboration," "artificial intelligence," "techno stress," and "the cloud". In its buzz-seeking pursuit of improved business processes and trust, blockchain seems to have stung all sectors. Yet, the financial sector is only one example of an industry that can see this technology as a disruptive innovation that must be regulated. Although blockchain technology undoubtedly has useful applications in the future, its reputation has certainly suffered due to overstated expectations. Due to the widespread interest in Blockchain, dishonest businesses with dubious intentions have been able to set up shop. The public's attention and interest in the matter has increased, but it may have damaged some trust and confidence, especially in

the financial and technological industries. As a result, there has been a rise in scholarly investigation of the technology's theoretical foundations and practical uses. Throughout the many years since their origin as digital currencies, cryptocurrencies have developed into a widespread means of online payment. Payment with cryptocurrency has its own set of problems, mostly related to security, that are similar to those of more conventional online payment methods.

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