
RELATIONSHIP OF BLOCKCHAIN AND CRYPTOCURRENCY: A FUTURISTIC APPROACH

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ABSTRACT

Although cryptocurrencies are not accepted in all countries, they can be used for various transactions. Due to its nature, they can be used both as a medium of exchange and an investment. Due to the nature of transactions carried out through the internet, there is a high risk involved. The concept of blockchain technology is relatively new in the field of information technology. Its implementation has gained a lot of attention due to its potential to transform the way financial transactions are conducted. This paper aims to provide a brief overview of what is Cryptocurrency, Blockchain and their various uses and functionality. The researcher presents an extensive knowledge regarding crypto currency, blockchain technology, relationship between the two and their future altogether. A meticulous analysis has been made throughout the paper. A comparative and analytical way of research has been implemented for completion of the same. Various legislations and legal obligations have also been studied during the course of delving into the intricacies of various aspects of blockchain and cryptocurrency.

Keywords: Blockchain, Cryptocurrency, Transaction, Legislation, Technology.

INTRODUCTION

During the 1990s, many people still struggled to understand the internet. Despite the fact that it is a new technology, there are still a lot of smart people who understand it well. The group known as the Cypherpunks was formed in the 1990s by cryptographic activists John Gilmore, Eric Hughes, and Timothy May. They held regular meetings to discuss the various privacy issues that people have on the internet. They wanted to see more freedom for computer and internet users by using cryptography. Through their work, the group was able to create open-source software that can be used by people all around the world. In addition, May published a manifesto that talks about how to improve the way people interact with technology. The group wanted to create a digital currency system to increase their power over money. Aside from the group that created digital currencies, the other organizations that tried to implement such a system during the 1990s were also led by individuals such as David Chaum of DigiCash and Daniel Lynch of CyberCash. Despite the various efforts that these groups made during the 1990s, they were not able to create a successful digital currency system. In 2009, a decentralized cash system known as Bitcoin was created.

According to various experts, blockchain technology is disruptive. In 2008, a white paper by the pseudonymous Bitcoin creator, Satoshi Nakamoto, discussed the concept of a peer-to-peer electronic cash system. “The blockchain technology would allow people to perform financial transactions without requiring a third party. Its peer-to-peer network would then validate and authorize the transactions. According to the creator, this technology could eliminate the fees and control that financial institutions have over transactions. In order to create a record of all transactions, the network would use a type of proof-of-work that's based on a set of hashes. The longest chain would serve as a record of the transactions that were performed on the network, and it would also prove that the transactions came from the network's largest pool of CPU power. Messages would be broadcast on a best-effort basis, and nodes would be able to leave the network at will.”¹

“According to a website called BlockGeeks.com, a blockchain is a collection of records that are linked using cryptography. Each block contains a set of cryptographic hashes. Unlike other cryptocurrencies, blockchains are designed to be resistant to modification. The concept of a

¹Jake Frankenfield, WHAT IS CRYPTOCURRENCY? INVESTOPEDIA (2022), Cryptocurrency Explained With Pros and Cons for Investment (investopedia.com)

blockchain states that it can record transactions in a verifiable and permanent manner. Its use in electronic cash transactions has led to the development of various financial technology applications. Today, blockchains are being used in various applications such as healthcare, supply chain management, and agriculture. They can also be used in international development and real estate. Aside from financial applications, other blockchain-based applications are also being developed in various sectors and industries.”² After Bitcoin's success or failure, many people are now looking to implement its advantages in other areas.

Cryptocurrencies are digital moneys that can be exchanged for any type of physical currency. Bitcoin was the first digital money to emerge following the Great Recession. Its creators claimed that it would provide an alternative to the traditional financial system. The goal of Bitcoin and other cryptocurrencies is to replace the financial services provided by banks and other financial institutions with blockchain-based software. This technology eliminates the need for people to enter into agreements with other parties in order to transfer money. Bitcoin was able to achieve this by creating a single digital record that is widely accessible to anyone. Unlike the traditional financial records maintained by banks and other institutions, the blockchains of Bitcoin are replicated on various networks around the world. Miners are the individuals who perform various tasks on the network, such as validating transactions and adding new blocks to the blockchain. Each new addition to the network adds a set of new transactions to the record.

According to a 2017 report by Notling & Muller, cryptocurrencies have the potential to transform the way people pay for goods and services. Through blockchain technology, they can build a decentralized payment system that doesn't require the involvement of intermediaries such as banks. Unlike the traditional money system, cryptocurrencies do not require a central bank to perform its various tasks. Instead, they can be exchanged directly between two individuals. Some of the major cryptocurrencies that are currently used include Bitcoin, Ethereum, Litecoin, and IOTA. Due to the mathematical algorithm used to determine the number of digital currency units that can be issued, the total supply of digital money is limited. Various factors are expected to affect the development of cryptocurrencies in the future. Some of these include the actions taken by the government and central banks.

²Kate Ashford, WHAT IS CRYPTOCURRENCY? FORBES (2022),

RESEARCH QUESTIONS

The basic questions that are needed to be answered in this study are:

1. Whether cryptocurrency will be able to make itself capable and trustworthy enough to be accepted globally and replace traditional payment system through different legislations?
2. Whether blockchain is an important technology that are now being used by different governments in order to take control over cryptocurrency and its future aspects?

WHAT IS CRYPTOCURRENCY?

A cryptocurrency is a type of digital asset that is designed to be used as a medium of exchange. Its ownership records are stored in a database that is secured using strong cryptography.

“Cryptocurrencies are secure because they are built using strong cryptography. Unlike traditional currencies, which are issued by a central authority, cryptocurrencies do not have a central database. They are therefore immune from government manipulation and interference. Although some e-commerce platforms do not allow the use of cryptocurrencies, they can still be purchased and mined. Due to their high value, cryptocurrencies have become popular as a trading instrument. However, they are not widely used for retail transactions.”³ Unlike traditional currencies, cryptocurrencies are not backed by a central authority. Instead, they are issued through a proof-of-stake model. In this method, the owners of the cryptocurrency are given a portion of the token's value in return for their stake. Unlike paper money, cryptocurrencies do not have a central authority and are not issued in physical form. Instead, they rely on decentralized control to operate. When implemented with distributed ledger technology, each cryptocurrency can be used as a public ledger. A cryptocurrency is a digital form of money that can be used for transactions. They are built using blockchain technology, which only exists online. Over a thousand cryptocurrencies are currently in existence. Bitcoin, which was first introduced in 2009 as open-source software, was the first decentralized digital currency.

³ Research Guides: Fintech: Financial Technology Research Guide: Cryptocurrency & Blockchain Technology, Available at Home - Research Guides at Library of Congress (loc.gov)

EXAMPLES OF CRYPTOCURRENCY

- **BITCOIN:** Bitcoin, which was first introduced in 2009, is the world's most popular digital currency. It was created by a pseudonymous individual known as Satoshi Nakamoto.
- **ETHEREUM:** Ethereum, which was developed in 2015, is the second most popular cryptocurrency. It's a blockchain-based platform that enables users to create and manage their own digital assets.
- **LITCOIN:** Although it's similar to bitcoin, Litecoin has moved quickly to develop new features and innovations.
- **RIPPLE:** The company behind the popular blockchain platform, known as Ripple, has worked with various financial institutions. It can be used to track various types of transactions.

HISTORY OF CRYPTOCURRENCY

“The origin of cryptocurrencies can be traced back to the 1980s, when American cryptographer David Chaum invented a blinding algorithm that became the basis for modern web-based encryption. This innovation paved the way for the development of secure and unalterable information exchanges. Fifteen years later, software engineer Wei Dai published a white paper describing the principles of b-money, a virtual currency that was never used as an exchange. Although it had many of the same features as cryptocurrencies, it was never deployed as an alternative medium of exchange.”⁴

During the 1990s and 2000s, more conventional financial intermediaries such as PayPal emerged. Elon Musk, the founder of electric car maker Tesla, became a prominent advocate for cryptocurrencies. However, until the late 2000s, there was no real cryptocurrency.

In 1983, Chaum developed an anonymous electronic money called ecash. In 1995, he introduced a new type of digital currency called Digicash. Through this system, users could

⁴ The Balance. 2022. *History of Cryptocurrency*. Available at, History of Cryptocurrency (thebalancemoney.com)

withdraw notes from a bank without leaving their details exposed to third parties.

“In 1996, the US National Security Agency released a paper describing the design of a cryptocurrency system. The paper was first published in an MIT mailing list. In 1998, Wei Dai published a paper describing the concept of b-money, which was an electronic cash system. A few years later, software engineer Nick Szabo introduced bit gold, a type of electronic currency that was similar to bitcoin. Like bitcoin, bit gold required users to complete a proof-of-work function before it could be published.”⁵

1998 – 2009 The Pre-Bitcoin years

Although Bitcoin was the first digital currency to be created, there have been previous attempts at creating similar cryptocurrencies that are secured by encryption. These include Bit Gold and B Money.

2008 – The Mysterious MrNakamoto

A paper about Bitcoin was posted to a cryptography mailing list. It was written by someone who identified themselves as Satoshi Nakamoto.

2009 – Bitcoin begins

Bitcoin was created through the release of software. A paper about Bitcoin was posted to a cryptography mailing list. It was users to mine it. This process involves creating new bitcoins and verifying their transactions.

2010 – Bitcoin is valued for the first time

Since Bitcoin was only created through mining, it was impossible to determine its monetary value. In 2010, someone tried to sell their entire Bitcoin supply. At that time, its current value was around \$100 million.

2011 – Rival cryptocurrencies emerge

As the popularity of Bitcoin increases, more alternative currencies such as altcoins appear.

⁵ Marr, B., 2022. A Short History of Bitcoin and Crypto Currency Everyone Should Read.

These are often created to improve upon the Bitcoin's design. Some of these include Litecoin and Namecoin. There are currently over a thousand cryptocurrencies in circulation.

2013 – Bitcoin price crashes

After reaching \$1,000, the price of Bitcoin immediately begins to decline. Many investors who bought it at this point would have lost money due to the decline. It would take two years before it reaches its next \$1,000.

2014 – Scams and theft

“Despite its pseudonymous nature, Bitcoin has been a target for criminals. Due to its decentralized nature, it can be used by people who are looking to commit fraud. In 2014, Mt. Gox, the world's largest Bitcoin exchange, went offline. Hundreds of thousands of its users never saw their money again. It's still unclear what happened to the Mt. Gox's funds. However, it's believed that someone stole hundreds of millions of dollars.”⁶

2016 – Ethereum and ICOs

This year, one cryptocurrency almost stole Bitcoin's thunder. Ethereum, which is a blockchain-based platform, gained widespread popularity due to its emergence as an Initial Coin Offering. These platforms allow investors to trade shares in startup ventures in the same way they would with cryptocurrencies. However, the US Securities and Exchange Commission warned against investing in these types of projects due to the lack of oversight.

2017 –Bitcoin reaches \$10,000 and continues to grow

The rise in the number of places where Bitcoin can be spent contributed to the cryptocurrency's continued popularity. As more and more uses of the digital currency emerged, more money flowed into the ecosystem. During this period, the market cap of all cryptocurrencies has risen from \$11 billion to over \$300 billion. Several banks have indicated they are exploring ways they can use Bitcoin. Meanwhile, the technology behind Bitcoin has sparked a revolution in the financial industry.

⁶ NerdWallet. 2022. What Is Cryptocurrency? Here's What Investors Should Know, available at Cryptocurrency Basics: Pros, Cons and How It Works - NerdWallet

WORKING OF CRYPTOCURRENCY

The concept of cryptocurrencies is that they operate on a software network, where multiple computers run the same program. No one controls the network.

“The computer networks that run cryptocurrencies function as two separate entities: one is to process transactions, while the other is to maintain a database that records those transactions. When a transaction is made, it is then connected to a block, which is a long, unbroken chain. The blockchain is a digital ledger that records transactions. It is distributed across a group of computers. No single system controls its operations. A decentralized network then keeps the ledger running. According to proponents of blockchain technology, it can improve transparency and security by allowing people to share information across a network. However, sceptics say it can be very inefficient and could use too much energy.”⁷

When it comes to investing in cryptocurrencies, most investors are focused on the strength and utility of the underlying blockchain. This ensures that they are getting a good return on their money. All transactions in cryptocurrencies are recorded on the blockchain, which is a public ledger. These transactions are checked to make sure that they are legitimate before they are added to the chain. The power used to validate cryptocurrencies' transactions is remunerated with the underlying currency. This is done through a proof-of-work mechanism, which is an incentive-driven system. Miners receive coins for their hard work. Unlike traditional bank accounts, investors in cryptocurrencies do not have to keep their money in a physical bank. Instead, they have digital address addresses that contain long strings of numbers and letters. These addresses allow people to send and receive funds. Public keys are available and can be used to send and receive cryptocurrency. It is widely believed that Bitcoin has fundamentally changed the way people think about money. It has opened a new era of financial thought and has created a new platform for investing.

ADVANTAGES OF CRYPTOCURRENCY

- Due to inflation, many currencies have lost their value over time. Most cryptocurrencies are released with a fixed amount, which means that its value will increase as the demand

⁷ Vigna, P., 2022. What Is Cryptocurrency, and How Does It Work? Available at What Is Cryptocurrency, and How Does It Work? - WSJ

increases. This ensures that the market will continue to keep up with the demand.

- The governance and maintenance of a currency are two of the most important factors that affect its development. Developers and miners are responsible for keeping the transactions in the blockchain up-to-date and accurate. They are paid for doing so, which means that they keep the records of the transactions secure.
- Due to the nature of the blockchain, security and privacy are some of the most important factors that affect the development of cryptocurrencies. The ledger is composed of various mathematical puzzles, which makes it harder to crack. These puzzles prevent unauthorized access to the data stored in the blockchain.⁸
- Aside from the US dollar, other currencies such as the British pound, Japanese yen, and Indian rupee can also be used to purchase cryptocurrencies. With the help of various exchanges and wallets, one can easily convert one currency into another without having to pay transaction fees.
- One of the main advantages of cryptocurrencies is that they are decentralized. Most of them are controlled by their developers or by organizations that have a significant amount of them. This eliminates the possibility of having one person determine the value and flow of a currency. This ensures that the currency is stable and secure.
- One of the main advantages of cryptocurrencies is their ability to reduce the transaction fees. With the help of them, users can send money across borders without paying any fees.
- Since they are decentralized, cryptocurrencies have always been an ideal solution for conducting transactions. They can perform fast transactions even if they are international.

DISADVANTAGES OF CRYPTOCURRENCY

- Due to the high security of cryptocurrencies' transactions, it's not hard for the government to monitor and track its users. Also, Bitcoin has been used for illegal

⁸ Advantages and Disadvantages of Cryptocurrency in 2020, GeeksforGeeks.

transactions in the past. These include buying drugs on the dark web and converting illicit money into a clean asset.

- Since data losses can lead to financial losses, developers have created secure and untraceable source code for cryptocurrencies. This will make it safer to store money in them. However, if a user loses their private key, their wallet will remain locked away.
- Although cryptocurrencies are decentralized, their creators and organizations still control the flow of money in the market. This can lead to significant price fluctuations.
- Some cryptocurrencies only have limited availability in other currencies. This means that users have to convert their coins into one of the major currencies, such as Bitcoin or Ethereum. Doing this can lead to additional transaction fees.
- Due to the nature of mining, cryptocurrencies can have a negative environmental impact. One of the biggest factors that contributes to this is Bitcoin, which requires a lot of energy to operate. This has caused a huge environmental impact in China.
- Although cryptocurrencies are secure, exchanges are not always as secure as they should be. They store the personal data of their users, which can be stolen by hackers. This data can then be used to access other accounts. Several exchanges, such as Mt Gox and Bitfinex, have been hacked in the past. Bitcoin has been stolen in excess of millions of dollars.
- Due to the nature of cryptocurrencies, there is no refund or cancellation policy when it comes to transactions. This eliminates the possibility of people scamming others out of their money. It can also be used by people to get their money back.

REGULATORY FRAMEWORK GOVERNING CRYPTOCURRENCY IN INDIA

Although “cryptocurrencies are not regulated nor are they prohibited, individuals and entities are still required to comply with the existing laws when dealing with them. In addition, banks and other financial institutions are required to carry out due diligence in line with the existing regulations. In response to a question in the Parliament of India, the Minister of Finance stated that the current regulatory regime for cryptocurrencies is in line with the guidelines issued by

the Reserve Bank of India. He also noted that various steps are being taken to regulate the industry.”⁹

“The Government does not consider crypto-currencies legal tender or coin and will take all measures to eliminate use of these crypto-assets in financing illegitimate activities or as part of the payment system. The Government will explore use of block chain technology proactively for ushering in digital economy. A High-Level Inter-Ministerial Committee (IMC) constituted under the Chairmanship of Secretary (Economic Affairs) to study the issues related to VCs and propose specific actions to be taken in this matter recommended in its report that all private cryptocurrencies, except any cryptocurrency issued by the State, be prohibited in India. The Government would take a decision on the recommendations of the IMC and the legislative proposal, if any, would be introduced in the Parliament following the due process.”

The proposed Bill to create a framework for the establishment of an official digital currency by the Reserve Bank of India is expected to be introduced in the Lower House of Parliament on January 29, 2021. It also prohibits the private use of cryptocurrencies in India. Although the exact details of the proposed legislation are not yet available, it is expected that it will regulate cryptocurrencies according to their various functions and uses. It will also allow the use of cryptocurrencies for certain applications where the cryptographic token issued does not violate the Indian Rupee's domain. In order to encourage the development of cryptocurrencies that are not yet ready for use, the government may allow the block chain industry to create new technology and cryptographic token that are unusable as currencies.

In this context, it is apposite to quote from the SC Judgment of 2020, wherein it specifically highlighted the chimeric nature of cryptocurrencies, noting that:

“It is clear from the above that the governments and money market regulators throughout the world have come to terms with the reality that virtual currencies are capable of being used as real money, but all of them have gone into the denial mode (like the proverbial cat closing its eyes and thinking that there is complete darkness) by claiming that VCs do not have the status of a legal tender, as they are not backed by a central authority. But what an article of merchandise is capable of functioning as, is different from how it is recognized in law to be. It is as much true that VCs are not recognized as legal tender, as it is true that they are capable of

⁹ Legality of cryptocurrency in India - iPleaders. Available at Legality of cryptocurrency in India - iPleaders

performing some or most of the functions of real currency.”¹⁰

Currently, India does not have a law that specifically regulates the activities of cryptocurrencies and virtual currencies. This will change once the draft of a proposed bill on digital currency regulation is made public. The goal of the proposed legislation is to establish a framework for regulating the activities of digital currencies. To understand the government's position on cryptocurrencies, we look at its various positions over the years.

2013 – 2017

The first recognition of cryptocurrencies in India came through the actions of the Reserve Bank of India, which issued various warnings about the risks associated with these virtual currencies from 2013 to 2017. These warnings were aimed at educating the public about the various aspects of these transactions.

2018

“In his 2018–19 budget speech, the Finance-Minister stated that the government does not consider cryptocurrencies legal tender and will take all necessary steps to prevent their use in the financing of illegitimate activities. This statement has been frequently quoted by the MoF in its responses to various questions submitted to it by Parliament. Following the release of the warning circulars, the Reserve Bank of India (RBI) issued a circular on April 5, 2018, which directed various entities, including banks and payment system providers, to stop providing services related to the settlement or dealing with virtual currencies (VCs).” The circular stated that these services, which include maintaining accounts, trading, clearing, and settling, were not allowed. The central bank also asked all the entities that provide these services to immediately cease their operations. A writ petition was filed in 2018 challenging the validity of the Ring-Fencing Circular. On March 4, 2020, the Supreme Court of India (SCI) agreed to set aside the circular on the basis of proportionality.¹¹

2019

In February 2019, the government released the IMC Report, which proposed various actions to

¹⁰ *Internet and Mobile Association of India v. Reserve Bank of India*, AIR 2021 SC 2720

¹¹ *Ibid.*

be taken in response to the growing concerns about virtual currencies. The report was prepared by an inter-ministerial committee that was formed in November 2017 to study the issue of cryptocurrencies. The rise of Distributed Ledger Technologies has raised concerns about their potential to destabilize the Indian economy. The use of cryptocurrencies by cross-border transactions has also been identified as a potential threat. The report defines a virtual currency as a medium of exchange that can be traded either as a store of value or a unit of account. However, since they lack a sovereign guarantee, they are not considered legal tender. Cryptocurrencies are different from traditional currencies due to their decentralized nature. They are also cryptographic subsets of VCs. A token is a type of asset or financial instrument that can be issued by a company. It can be categorized into two categories: utility tokens and security tokens. The proposed creation of a central bank digital currency would help address the concerns of consumers and prevent them from falling prey to fraud. It would also help minimize the negative impact of cryptocurrencies on the economy. One of the main features of the IMC Report was the bill that was proposed to ban the use of cryptocurrencies in India. The bill, which was referred to as the Old Bill, was aimed at restricting the activities related to the digital currency. It included a ban on mining, issuing, transferring, selling, and dealing in cryptocurrencies.

2020

In 2020, the NITI Aayog released the first of two draft strategy papers on blockchain, which aims to improve the ease of doing business and living in India. The strategy paper proposed a roadmap for the widespread use of blockchain technology in various areas, such as improving governance and business processes. It also recognized cryptocurrencies as a type of asset that could be used as a unit of value exchange.

2021

In January 2021, the Ministry of Information Technology released a draft strategy on blockchain that highlighted various regulatory gaps related to the widespread use of cryptocurrencies. These include the lack of clear and consistent regulations regarding the use of tokens, the lack of a Know-Your-Customer standard, and the need for adequate data protection measures. On January 25, 2021, the Reserve Bank of India released a booklet on payments and settlement systems in India. It defined a central bank deposit as a legal tender

and a liability in digital form, which can be exchanged or converted at par with the traditional cash deposits.¹² On March 24, 2021, the Corporate Affairs Ministry issued a notification that amends the Schedule III of the Companies Act to require companies in India to prepare their balance sheets and profit and loss accounts. The amendments require the companies to provide certain details about their operations. The details that the companies must provide include the amount of currency they have held as of the reporting date, their profit or loss on cryptocurrency-related transactions, and their deposits or advances from other people. In response to reports that some banks were still quoting from the earlier Ring-Fencing Circular, the Reserve Bank of India issued a clarificatory circular on May 31, 2021. It stated that the circular was no longer valid as it did not comply with the Supreme Court's ruling. The central bank also did not ask banks and other financial institutions to stop carrying out due diligence processes related to the use of cryptocurrencies. These processes should comply with the regulations related to money laundering and terrorism financing. It also noted that these entities should maintain proper records related to overseas remittances. The absence of the word banning from the titles of the proposed legislation and the clarificatory circular suggests that the government is taking a more lenient approach towards cryptocurrencies in India.

WHAT IS BLOCKCHAIN TECHNOLOGY?

The concept of a blockchain is that it's a distributed database that's shared among the network's nodes. Its purpose is to store and transmit data in a digital format. This technology is commonly used in cryptocurrencies such as Bitcoin to maintain a record of transactions. A blockchain is a type of data storage that collects information in groups, which are referred to as blocks. When a block is filled, it is linked to the previous one, and all new information is added to the chain. Basically, "A database typically stores its data into tables, while a blockchain structures its data into blocks. When a block is filled, it sets in stone and becomes part of the time line that the data is stored in."¹² A blockchain is composed of various records, such as transactions and cryptographic hashes. Each block contains a unique set of data, such as a timestamp. The timestamp helps prove that the data was stored in the previous block. Each block contains information about the previous one, and the additional blocks reinforce the ones before it. This ensures that the data in any given block is not affected by any changes. "As a public ledger, a blockchain is typically managed by a network. Its nodes follow a protocol to validate new

¹² What is blockchain? BLOCKCHAIN EXPLAINED: WHAT IS BLOCKCHAIN?, Available at What is blockchain? | Euromoney Learning

blocks. Although records are not unalterable due to the nature of the distributed computing system, they are generally considered secure.”¹³

HISTORY OF BLOCKCHAIN

Although blockchain is still in its infancy, it has already experienced a lot of interesting and significant developments. This timeline aims to provide a brief overview of some of the most significant events in the history of the technology.

2008

Satoshi Nakamoto, a pseudonym for a person or group, publishes, “Bitcoin: A Peer-to-Peer Electronic Cash System.”

2009

Hal Finney, a computer scientist, and the mysterious creator of Bitcoin, known as Satoshi Nakamoto, conducted the first successful transaction on the digital currency.

2010

Programmer Laszlo Hanyecz purchased two Papa John's pizza using Bitcoin. At the time, he transferred about 10,000 Bitcoin units, which were worth around \$60,000. Bitcoin's market cap has now reached over \$1 million.

“2011

- 1 BTC = \$1USD, giving the cryptocurrency parity with the US dollar.
- Electronic Frontier Foundation, Wikileaks and other organizations start accepting Bitcoin as donations.

2012

- Blockchain and cryptocurrency are mentioned in popular television shows like The

¹³ What is blockchain technology? - IBM Blockchain, IBM.

Good Wife, injecting blockchain into pop culture.

- Bitcoin Magazine launched by early Bitcoin developer VitalikButerin.

2013

- BTC market cap surpassed \$1 billion.
- Bitcoin reached \$100/BTC for the first time.
- Buterin publishes “Ethereum Project” paper suggesting that blockchain has other possibilities besides Bitcoin (e.g., smart contracts).

2014

- Gaming company Zynga, The D Las Vegas Hotel and Overstock.com all start accepting Bitcoin as payment.
- Buterin’s Ethereum Project is crowdfunded via an Initial Coin Offering (ICO) raising over \$18 million in BTC and opening up new avenues for blockchain.
- R3, a group of over 200 blockchain firms, is formed to discover new ways blockchain can be implemented in technology.
- PayPal announces Bitcoin integration.

2015

- Number of merchants accepting BTC exceeds 100,000.
- NASDAQ and San-Francisco blockchain company Chain team up to test the technology for trading shares in private companies.

2016

- Tech giant IBM announces a blockchain strategy for cloud-based business solutions.
- The government of Japan recognizes the legitimacy of blockchain and cryptocurrencies.

2017

- Bitcoin reaches \$1,000/BTC for the first time.
- Cryptocurrency market cap reaches \$150 billion.
- JP Morgan CEO Jamie Dimon says he believes in blockchain as a future technology, giving the ledger system a vote-of-confidence from Wall Street.
- Bitcoin reaches its all-time high at \$19,783.21/BTC.
- Dubai announces its government will be blockchain-powered by 2020.

2018

- Facebook commits to starting a blockchain group and also hints at the possibility of creating its own cryptocurrency.
- IBM develops a blockchain-based banking platform with large banks like Citi and Barclays signing on.

2019

- China's President Ji Jinping publicly embraces blockchain as China's central bank announces it is working on its own cryptocurrency.
- Twitter & Square CEO Jack Dorsey announces that Square will be hiring blockchain engineers to work on the company's future crypto plans.
- The New York Stock Exchange (NYSE) announces the creation of Bakkt - a digital wallet company that includes crypto trading.

2020

- Bitcoin almost reaches \$30,000 by the end of 2020.
- PayPal announces it will allow users to buy, sell and hold cryptocurrencies.

- The Bahamas becomes the world's first country to launch its central bank digital currency, fittingly known as the Sand Dollar"¹⁴

ELEMENTS OF BLOCKCHAIN

1. **Distributed Ledger Technology:** The distributed ledger allows network participants to keep track of all transactions. This eliminates the duplication of effort that occurs in traditional business networks.
2. **Immutable Records:** No one can alter or tamper with the details of a transaction that has been recorded in the shared ledger. If an error occurs, a new transaction is added to the record to correct it.
3. **Smart Contract:** A smart contract is a set of rules that can be executed on the blockchain to speed up transactions. For example, a contract can specify the terms of a bond transfer.

WORKING OF BLOCKCHAIN

The movement of an asset is shown in its various forms through transactions. These include the movement of a product or an intellectual property. The data collected can be used to analyse the condition of the asset. The data collected through transactions is stored in blocks, which are linked together to form a chain of records. These blocks can be used to confirm the exact sequence of transactions and prevent unauthorized changes. Each block of the blockchain is strengthened to prevent unauthorized changes. This ensures that the network is tamper-evident, which eliminates the possibility of unauthorized transactions.

CLASSIFICATION OF BLOCKCHAIN

Blockchain can be classified under four categories.

- **Public Blockchains:** A public blockchain does not have access restrictions. Its users can send transactions to it and become a validator, which is a part of the network's consensus protocol. Usually, such networks offer incentives to those who secure them.

¹⁴ History of Blockchain – Javatpoint, available at History of Blockchain - Javatpoint

- **Private Blockchains:** A private blockchain is typically only allowed to be joined by the network administrators. Only the network administrators can authorize a user. The term distributed ledger refers to decentralized databases that are not hosted in ad-hoc computing clusters.
- **Hybrid Blockchains:** A hybrid blockchain is a type of distributed network that combines the features of a traditional blockchain and a decentralized one. Its exact workings can vary depending on the centralization decentralization used.
- **Sidechains:** A sidechain is a type of distributed ledger that runs parallel to the primary blockchain. When entries from the primary blockchain are linked to the sidechain, the latter can then operate independently. This allows the sidechain to perform various functions, such as record keeping, without relying on the centralization of the blockchain.

ADVANTAGES OF BLOCKCHAIN

- Your data is incredibly important, and blockchain can help protect it by creating a record that can't be changed. "It can also be used to prevent unauthorized activity and minimize fraud. Privacy concerns can also be solved by implementing anonymization and restricting access."¹⁵
- Without blockchain, organizations would have to keep separate databases for each transaction. With blockchain, all transactions are immutable and are being recorded in multiple locations. This eliminates the possibility of fraud.
- Through blockchain, an asset can be traced back to its origin at every step of its journey. This can help provide consumers with the necessary proof of its authenticity. It can also help prevent fraud and improve the efficiency of the supply chain.
- Traditional paper-based processes often lead to errors and time-consuming tasks. By implementing blockchain, these processes can be streamlined and completed faster,

¹⁵ Advantages and disadvantages of Blockchain, BBVA.CH (2021)

with fewer errors and fewer manual steps. It can also be used to store documents and provide a record of all transactions.

- With the use of smart contracts, transactions can be automated, which can increase their efficiency and speed. These contracts can also reduce the need for third parties to verify the terms of a contract. For instance, in insurance, a customer can file a claim and have it settled immediately after providing all the necessary documents.

DISADVANTAGES OF BLOCKCHAIN¹⁶

- Unfortunately, implementing and managing the technology's various components and functions can be very costly for companies. This is especially true for small and medium-sized businesses, which are typically the ones that will be most affected by the implementation costs.
- One of the most common factors that businesses consider when it comes to implementing new technology is the inefficient use of network resources. Having multiple users validate the same operations can lead to a huge waste of energy.
- Another issue that businesses consider when it comes to implementing new technology is the security of their private keys. Having lost these keys can make it almost impossible to recover them, which can lead to a huge issue for all those who hold them.
- As the number of users grows, the amount of space required to store all of these operations will also increase. This issue can eventually lead to the over-capacity of the hard drives.
- The lack of intermediaries will also cause the number of jobs to disappear as Blockchain technology is implemented. This will happen as the various sectors of the financial industry that perform validation will be completely eliminated.

¹⁶ Supra note 15.

REGULATORY FRAMEWORK GOVERNING BLOCKCHAIN IN INDIA¹⁷

The use of blockchain technology has been beneficial to the legal and judicial frameworks. It has allowed for the creation of smart contracts, the filing of documents, and the resolution of disputes. Currently, there is no legislation in India that specifically addresses the regulation of blockchain technology and its various applications. However, existing regulators have the power to oversee the activities of blockchain-related companies. The Securities and Exchange Board of India (SEBI) and the Reserve Bank of India (RBI) are two of the regulators that oversee the activities of blockchain-related companies in India. Despite the slow growth rate, technological advancements have been beneficial to the legal industry. They have made the procedures of the judiciary more understandable. Despite the limitations that the courts have to deal with, the legal industry has still welcomed the various technological advancements that have been made. One of these is the implementation of an e-committee by the Supreme Court. This allowed the courts to continue operating during the pandemic. However, blockchain is one such technology that is yet to be fully utilised. Several countries, such as the UK, China, and Canada, have already started implementing blockchain technology in their legal systems. This will allow them to reduce their costs and improve the efficiency of their courts. It will also help strengthen the public's trust in the judiciary.

Legal validity of Smart Contracts

One of India's most desirable employers, the Reserve Bank of India, defines a smart contract as a line of code that can execute itself after meeting certain conditions. This makes them ideal for organizations that are regulated. No human error is allowed in the execution of an agreement as every party checks the details of the agreement at the start of its operation. All of the procedures and steps are recorded and processed at the same time. For firms that deal with sensitive data, smart contracts are a profitable option. They can be used to store and share sensitive information, such as franchise agreements. However, they can also expose sensitive data to unauthorized users. Unlike smart contracts, traditional contracts can't be changed. This means that parties have to enter new contracts every time they come up with an obligation. It can be a challenge for lawyers to understand the basic concepts of a smart contract as they might not be able to interpret the software code that forms the contract. The Indian Contract

¹⁷ Blockchain & Cryptocurrency Laws and Regulations | India | GLI- Global Legal Insights - International legal business solutions.

Act, 1872, defines a valid contract in India. This includes the elements that are required to be fulfilled in order for it to be valid and enforceable. After conducting a comprehensive study, the government can issue a policy supporting smart contracts. However, it will take time for the legislature to adopt and implement regulations that will define and codify these legal instruments.

Electronic Contracting, Data Privacy and Cybersecurity

The Information Technology Act of 2002 allows digital signatures to be utilized to authenticate documents. For smart contracts, digital signatures are used to limit their access and comply with certain procedures. However, this Act does not explicitly ban the use of blockchain technology for the generation of digital signatures. Due to the lack of an express recognition of the same, contracts that require a signature to be authenticated using blockchain technology are invalid. Even though there is no law mandating the protection of data privacy and security in India, blockchain networks are still required to follow the country's general principles and laws.

Blockchain and Intellectual Property Rights¹⁸

One of the most effective uses of blockchain technology is to create contracts that manage the ownership and use of intellectual property. This can help prevent unauthorized activities and ensure that the correct license is in place. In the intellectual property arena, blockchain technology can help in validating a product's authenticity by recording details about its origins and manufacturing processes. This can help prevent counterfeiting and unauthorized use of intellectual property. Due to the nature of blockchain networks, the enforceability of intellectual property rights is a concern.

A blockchain-based technology can be granted protection under the Patents Act of 1970 and the copyright act of 1957. However, it can be difficult to register a blockchain as a patent due to certain provisions of the Act. These include Section 3(k) of the Act, which prohibits a computer program or mathematical process from being registered as a patent. It is easier for a blockchain to obtain copyright protection if it pretends to be a computer program. This is

¹⁸ Shivani Singh, BLOCKCHAIN TECHNOLOGY, LEGAL FRAMEWORK AND ITS APPLICATION IN THE LEGAL SYSTEM, Legal Blog | Law Articles | LegalBots.in: India's Leading Law Jobsite

because Section 13 of the copyright act provides protection for computer programs.

Competition Law and Blockchain

The current framework of competition law does not address the various issues that blockchain's operation may cause. For instance, it could make it easier for competitors to fix prices by establishing a consortium. Another issue that blockchain technology could cause is the restriction of a new entrant's access to a network. This could result in market foreclosure.

Blockchain and Online Dispute Resolution (ODR)

Due to its cost-effective nature and high level of confidentiality, commercial arbitration is the preferred method of resolving disputes for large economic entities. However, with the emergence of blockchain-based alternative dispute resolution (ODR) platforms, it is starting to become more prevalent in the dispute resolution industry. With the increasing number of jurisdictions adopting blockchain-based ODR platforms, it is reasonable to believe that the courts could eventually resolve commercial disputes more cost-effectively.

BLOCKCHAIN AND CRYPTOCURRENCY: RELATIONSHIP AND FUTURE

WORKING OF BLOCKCHAIN AND CRYPTOCURRENCY TOGETHER

The concept of blockchain is a decentralized, public ledger that records information across a network of computers. “When a transaction takes place, the details are stored in blocks, which are added to the chain when the full number of transactions is complete. Unlike other cryptocurrencies, blockchain uses encryption to prevent unauthorized access. This makes it incredibly difficult for governments to control its usage.”¹⁹

Although Bitcoin was the first digital currency, the list of cryptocurrencies has since grown to over 10,000. Although many people have doubts about its legitimacy, blockchain technology was widely regarded as the foundation for Bitcoin. Despite the various technological advancements that have occurred in the past few years, there is still a lot of confusion regarding the terms blockchain and cryptocurrency.

¹⁹ The relationship between Blockchain and cryptocurrency, Getsmarter Blog (2022)

Although blockchain is primarily used by cryptocurrency users, it can also be utilized in other applications, such as financial services. Due to its decentralized nature, it can be widely used across various industries. The term blockchain has become synonymous with cryptocurrencies, as it was the database that stored the first Bitcoin. Before blockchain was implemented in 2009, it wasn't known as such. It was initially conceptualized in 1982 as a type of secure chain of information that could be accessed by a single user. Due to its decentralized nature, it was the first digital currency to gain widespread acceptance.

INNOVATIVE APPLICATIONS OF BLOCKCHAIN UNDERScoreD BY CRYPTOCURRENCIES²⁰

Developers are starting to use blockchain technology in various fields, such as healthcare, real estate, and government. Its secure and powerful nature has attracted the attention of cryptocurrencies.

Finance

One of the most critical functions of the financial sector is to transfer money from one entity to another. With blockchain, the process of transferring money is now decentralized, which eliminates the need for a bank. This eliminates the need for intermediaries, which can be costly and time-consuming. Through the ability to track all transactions, blockchain-based payments can increase the transparency and security of their transactions. This is beneficial for both the parties involved and for regulators.

Smart Contracts

It is a simple concept: It allows people to easily exchange assets, legal documents, and anything of value in a transparent and ethical manner. A smart contract is a type of automated program that enables a seller and buyer to complete their transactions automatically. It can be performed on a blockchain network, which makes it both transparent and verifiable. This type of automation can help boost productivity and reduce costs.

²⁰ Sam Daley, 34 BLOCKCHAIN APPLICATIONS AND REAL- WORLD USE CASES DISRUPTING THE STATUS QUOBUILT IN, available at 38 Blockchain Applications and Real-World Use Cases 2024 | Built In

Cyber Security

The data stored on a blockchain network is secure because it can be accessed by its various nodes, which can then identify the source of a disputed change. This technology has the potential to be used in various cybersecurity applications. One of the most important steps in securing a network is to store information across devices. Doing so can help prevent a hacker from exploiting a single vulnerability. Decentralizing control over edge devices can also help prevent attacks.

Health Records

A secure, decentralized, and trustworthy blockchain system can be used to store and manage healthcare records. These records are typically collected from various sources such as medical facilities, pharmacies, and clinics. Electronic health records are digital records that are managed by doctors. As patients manage their PHRs, the validity of their information can be doubted. Having this data stored on blockchains would allow them to be transparent, unchangeable, and secure. Unlike PHRs, EHRs are typically stored in legacy systems, which can't be easily accessed by different healthcare facilities. With blockchains, the data can be stored securely on a decentralized platform.

RBI'S ASSESSMENT ON CRYPTOCURRENCY AND BLOCKCHAIN

The rise of cryptocurrencies has dominated the minds of various people, including the technology community and the financial industry. According to their proponents, these digital currencies have the potential to transform the way financial transactions are conducted. There are also various questions about their future. Decentralized finance or DeFi is the concept that cryptocurrency and other digital assets could transform the way financial transactions are conducted. The goal of blockchain is to make financial intermediation redundant.

Aside from being a technology, cryptocurrencies also appear to have an ideology. In a video posted by the Financial Times, Bitcoin is described as a product of healthy dissent and a desire for a better future. The same video also states that cryptocurrencies embody a core tenet of anarchism. The concept of cryptocurrencies is that they can be used to bypass the traditional financial system and establish a new one on a larger scale. Some believe that this could lead to the separation of money from the State. In a Time magazine article, Nassim Nicholas Taleb

referred to Bitcoin as an insurance policy against an apocalyptic future. This argument suggests that cryptocurrencies should not be regarded as merely another form of currency or asset.

Although cryptocurrencies are designed to function like a currency, they do not actually function like one. First, they usually have an issuer, which is usually a government entity. Secondly, currencies have always been either debt instruments or commodities. Unlike other currencies, cryptocurrencies do not have an actual government entity. They are not considered instruments of debt or commodities, and they do not have intrinsic value. Therefore, even if blockchain technology provides the trust needed to operate as a currency, it cannot perform the role of a currency in the private sector.

Some countries, however, still treat cryptocurrencies as financial assets. This is problematic since all forms of financial instruments have underlying cash flows, and they need to be held by some individual to be considered a liability. There is also an effort to classify cryptocurrencies as commodities. However, since they do not have intrinsic value, they are not considered commodities. This is an awkward attempt to equate cryptocurrencies with gold. Unlike gold, which can be modified by design, limiting supply in cryptocurrencies is not the same as it is in gold. Also, since gold is not actually money, it has to be issued by a sovereign to make it.

If cryptocurrencies are not a physical asset or currency, then what are they? The proponents of cryptocurrencies have tried to imply that they are digital assets, but this is not possible as they do not have an underlying use. For instance, car hire software does not have an underlying asset. The hype surrounding cryptocurrencies has created enough interest that people are willing to pay for the rights to use an electronic code. This code, which is not practical, has created enough hype to convince people that it could be bought by others.

Bitcoin has also performed well as a store of value. However, it is important to note that cryptocurrencies are very different from other types of financial instruments as they are not like a traditional currency. They are instead like gambling contracts that are working like a Ponzi scheme. Ponzi schemes usually invest in income-producing assets. For example, a bitcoin is like a zero-coupon perpetual bond, which means that the investor would not get paid back. A similar bond, on the other hand, would be valued at zero. If the equilibrium value of cryptocurrencies does not return to its previous level, then the long-term prognosis for investors

is not good.

Cryptocurrencies are not just digital assets; they also play a crucial role in finance. For instance, an equity share can be used to raise capital, a bond can be used to borrow money, and a mutual fund can be used to manage risk. Unlike other financial instruments, cryptocurrencies do not have an intrinsic value. They are instead used as a medium of exchange. Because of their volatility, it is not feasible for them to perform the functions of a currency. There is also no proof that people are using bitcoins as a form of payment. Also, there is not enough evidence to suggest that businesses are using cryptocurrencies.

It has been argued that cryptocurrencies are useful as a store of value. A closer look at the argument shows that they are comparable to other types of assets such as paintings and financial instruments. Despite the current high valuation, cryptocurrencies are not considered as a store of value. If a certain number of people decide to stop participating in the market, the entire value of the asset could easily collapse. The hype surrounding cryptocurrencies has created a lot of concern about their potential to disrupt the financial industry. However, this is not the case as they are not designed to meet the needs of the current market. One of the main risks associated with cryptocurrencies is their structure. They are not designed to be regulated by the government. They are also not subject to the same standards as other financial instruments.

CONCLUSION

Blockchain technology and cryptocurrencies have a profound impact on the digital economy because of their ability to use incentives to coordinate economic activity without relying on traditional intermediaries. This reduction in the cost of networking has implications for how we design, fund, secure, and operate digital platforms. It also changes how we protect personal and sensitive data and critical infrastructure and systems, as well as organize the custody of digital assets (financial or not). Although it does not remove the need for intermediaries, it fundamentally changes the nature of intermediation across multiple industry and public sector verticals, increasing competition for digital, financial, and government services. By lowering the cost of verification of transactions and their attributes, it also allows for data integrity to be embedded within digital marketplaces and services from the ground up. Overall, this opens opportunities for governments to improve the efficiency of their economies and of their operations. It also raises a number of issues related to the integration of these new digital assets

within existing regulatory frameworks and to their use in illegal activity. Governments that invest in understanding how the technology can support their objectives and transform their role, and that facilitate entrepreneurial experimentation in this area (e.g., through regulatory sandboxes), will be able to play a leading role and benefit from the returns from this new, exciting wave of technological progress.