A STUDY ON THE APPLICATION OF BLOCKCHAIN TECHNOLOGY SUPPORTS CRYPTOCURRENCY

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ABSTRACT

A Blockchain is essentially a distributed database of records, or public ledger, of all completed and shared transactions or digital events. Each transaction in the public ledger is validated by a majority of the system's members. Information can never be deleted after it has been submitted. The Blockchain includes a precise and verifiable record of every single transaction that has ever occurred. The most well-known application of Blockchain technology is Bitcoin, a decentralized peer-to-peer digital money. Although the digital currency bit coin is very contentious, the underlying Blockchain technology has performed perfectly and has found a wide range of uses in both the financial and non- financial worlds. The basic idea is that the Blockchain creates a means for achieving distributed consensus in the digital online world. By producing an unquestionable record in a public ledger, involved entities may be assured that a digital event occurred. It paves the way for the transition from a centralized to a democratic, open, and scalable digital economy. This innovative technology offers huge possibilities, and the change in this field has just begun. This research paper describes Blockchain technology supports crypto currency and some specific applications in both the financial and non- financial sector and also this research paper will examine the difficulties that lie ahead and the business opportunities for this fundamental technology that is going to transform our digital world.

Keywords: Blockchain, Bitcoin, Financial and non-financial sector, Technology

1. INTRODUCTION

Blockchain is a data management technology that was first used in Bitcoin by ―Satoshi Nakamoto‖ in 2008. Blockchain being a breakthrough technology in the modern world has sparked a great deal of influence and is gaining popularity rapidly, and overall Blockchain has garnered much attention from the financial and tech start-ups as well as academics. The reason for interest in this technology is its attributes that provides security, anonymity and data integrity, without providing control to a third-party vendor or an individual. A blockchain as the name suggests is a single list of chained-blocks in which each block contains various transactions or some other kind of data/information. Blockchain is based on various concepts; some of them are below such as:

- Decentralized data management.
- Distributed data saving and viewing protocols.
- Unchangeable form of data cannot go back and change a particular data set.

Blockchain can be used across a network of users; create assets and act as a shared book of financial records that has all the transactions recorded.Each set of information can easily be identified, queried and viewed, affording to greater transparency and trust to all the parties involved.

In this current digital economy is based on the reliance on a certain trusted authority. All the online transactions rely on trusting someone to tell us the truth— so it can be an email service provider telling us that our email has been delivered; it can be a certification authority telling us that a certain digital certificate is trustworthy; or also it can be a social network such as Face book etc., telling us that our posts regarding our life events have been shared only with our friends or it can be a bank telling us that our money had been delivered reliably to our dear ones in a remote country. The fact is that here we live our life precariously in the digital world by relying on a third entity for the security and privacy of our digital assets. The main fact remains that these third-party sources can be hacked, manipulated or compromised at any time.

The Blockchain technology is finding applications in wide range of areas like both *financial and non-financial.*

Financial institutions and banks no longer see blockchain technology as a threat to traditional business models. Nowadays, the world's biggest banks are in fact looking for opportunities in this area by doing research on innovative Blockchain applications. In a recent interview with

Rain Lohmus of Estonia’s LHV bank told that they found Blockchain is the most tested and secure for some banking and finance related applications.

Non-Financial applications opportunities are also endless. Here, the envision putting proof of existence of all legal documents, health records, and loyalty payments in the music industry, notary, private securities and marriage licenses in the Blockchain. By keeping the fingerprint of the digital asset instead of storing the digital asset itself, the anonymity or privacy objective can be achieved.

The objective of Blockchain technology is to introduce the distributed and decentralized solution that does not require the involvement of third party involvement. Blockchain has proven to be a more than an adequate solution to many issues the rest of the paper is organized as follows. Section 2 elaborates the literature of Blockchain technology and similar projects Section 3 enlightens the methodology of Blockchain technology challenges that need to focus on. Section 4 presents the solution that can help resolving the key challenges of Blockchain application. Finally, section 5 concludes the paper.

2. Review of literature

Swan's (2015)

In this research paper ―Economic benefits of blockchain "he illustrates the application scenarios of blockchain technology. In this book, the author describes that Blockchain is essentially a public ledger with potential as a decentralized digital repository of all assets- not only tangible assets but also intangible assets such as votes, software, and health data.

Lansiti and Lakhani (2017)

In their paper ―The impact of blockchain technology on business models‖ he states it will take years to truly transform the blockchain because it is a fundamental destructive technology, which will not drive implementation, and companies will need other incentives to adopt blockchain

O'Dair and Beaven (2017)

In this research paper ―How blockchain technology could transform the record industry "in the music industry, blockchain could improve the accuracy and advisability of copyright data and significantly improve the transparency of the value chain.

Swan (2017)

In their paper ―Towards a philosophy of blockchain‖ he states expound the economic value of block chain through four typical applications, such as digital asset registries, leapfrog technology, long-tail personalized economic services, and payment channels and peer banking services.

Fisch (2019)

In this research paper ―Initial coin offerings to finance‖ he illustrates assesses the determinants of the amount raised in ICOs and discusses the role of signaling ventures' technological capabilities in ICOs.

2.1 Scope of study

This research study concentrates on the role of Blockchain in the Crypto Currency.

2.2 Objective of the study

- To familiarizewith the application of technology in Crypto Currency
- To analyze the support of Blockchain technology in Crypto Currency
- To ascertain the difficulties on the business opportunities for this Blockchain technology

3.0 Research methodology

This is descriptive research method based on secondary data, which is collected through secondary sources, like reports, newspapers, magazines, internet for the research.

4.0 Blockchain Technology - Origination

In 1991, The Block chain technology was described by the research scientist Stuart Haber and W. Scott Stornetta. These people wanted to introduce a computationally practical solution for time-stamping digital documents so that they could not be backdated or tampered.

In 2004, the computer scientist and cryptographic activist Hal Finney introduced a system called Reusable Proof of work as a prototype for digital cash. It was a significant early step in the history of crypto currencies. The Reusable Proof of Work system worked by receiving a non-exchangeable or a non-fungible mess cash-based proof of work token in return, created an RSA-signed token that further could be transferred from person to person.

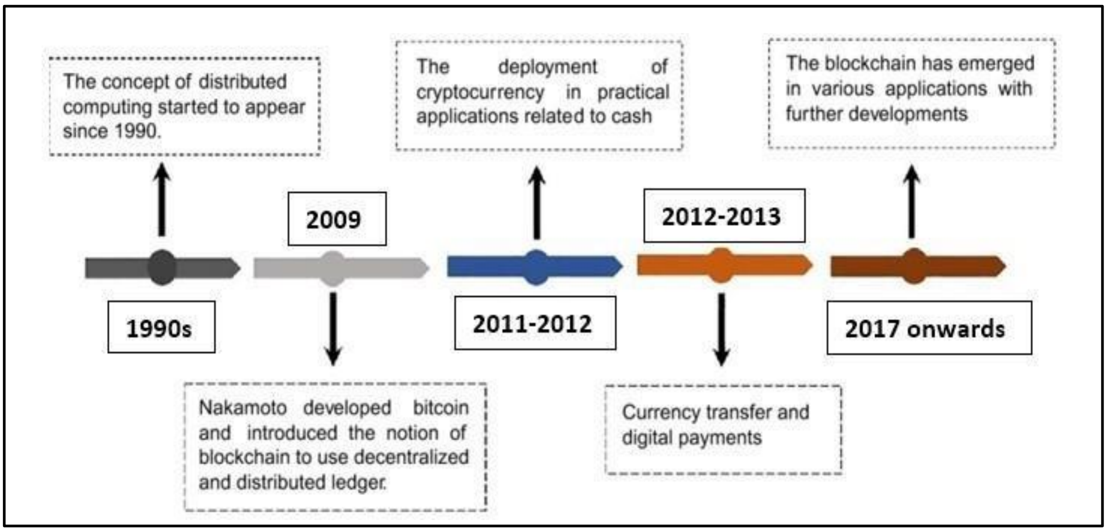

The concept of distributed computing started to appear since 1990.
2009
The deployment of cryptocurrency in practical applications related to cash
2012-2013
The blockchain has emerged in various applications with further developments
1990s
2011-2012
2017 onwards
Nakamoto developed bitcoin and introduced the notion of blockchain to use decentralized and distributed ledger.
Currency transfer and digital payments

Figure 4.1: The History of Bitcoin

Further,In the year 2008, Satoshi Nakamoto conceptualized the theory of distributed block chains.Also he improves the design in a unique way to add blocks to the initial chain without requiring them to be signed by trusted parties. The modified trees would be containing the secure history of data exchanges. It utilizes a peer-to-peer network for time stamping and verifying each exchange. It could be managed autonomously without requiring the central authority. These improvements were so beneficial that makesthe block chains as the backbone of crypto currencies. Today, this design serves as the public ledger for all transactions in the crypto currency space.

The evolution of Blockchain had been stable and promising. The words block and chain both were used separately in Satoshi Nakamoto's original paper but were ultimately popularized as a single word, the Block chain, by 2016. In the recent time, the file size of the crypto currencyBlockchain containing records of all transactions occurred on the network has grown from 20 GB to 100 GB.

4.1 Blockchain Technology Functioning

The concept of the Blockchain is by explaining how crypto currency works, since it is intrinsically linked to the Crypto currency. However, the Blockchain technology is applicable to any digital asset transaction exchanged online as given below:

1. Validate Entries
2. Safeguard Entries
3. Preserve Historic Record

1. Validate Entries
2. Safeguard Entries
3. Preserve Historic Record
YUP! HE SENT THE MONEY!
$10,000
Figure 1. Traditional online financial transactions using third trusted party (Banks, Paypal etc.)¹.

Figure 4.2: Traditional Online Financial Transactions using third trusted party (Banks, PayPal, etc.)

The unit receiving the digital currency then it verifies the digital signature, which imply the ownership of the corresponding ―private key‖, by using the ―public key‖ of the send er on the respective transaction. Each transaction is broadcasted to every node in the Bitcoin network and is then recorded in a public ledger after verification. An Every single transaction is needed to be verified for validity before it is recorded in the public ledger.

On the other hand, there is a question of maintaining the order of all these transactions that broadcast to every other node in the Bitcoin peer-to-peer network. All the transactions do not come in order in which they are generated, and as a result there is a need for a system to ensure that double-spending of the cryptocurrency does not happen. So, considering that all transactions are passed node by node through the Bitcoin network, so there is no guarantee that orders in which they are received at a node are the same order in which these transactions were generated or not.

As mentioned above, it states that there is a need to develop a mechanism so that the whole Bitcoin network is accepted regarding the order of transactions, which is a daunting task in the distributed system. Any new record or transaction on the block chain is the creation of a new block. Each record is then verified and digitally signed to confirm its authenticity. This block should be validated by the majority of system nodes before being uploaded to the network.

Mentioned below are the components of blockchain architecture:

- **Node**

Within the blockchain architecture, each user or machine has an independent copy of the whole blockchain ledger.

- **Transaction**

The smallest building unit of a blockchain system (records, information, etc.) that serves as the block chain's purpose.

- **Block**

A data structure used to store a series of transactions that is dispersed to all network nodes.

- **Chain**

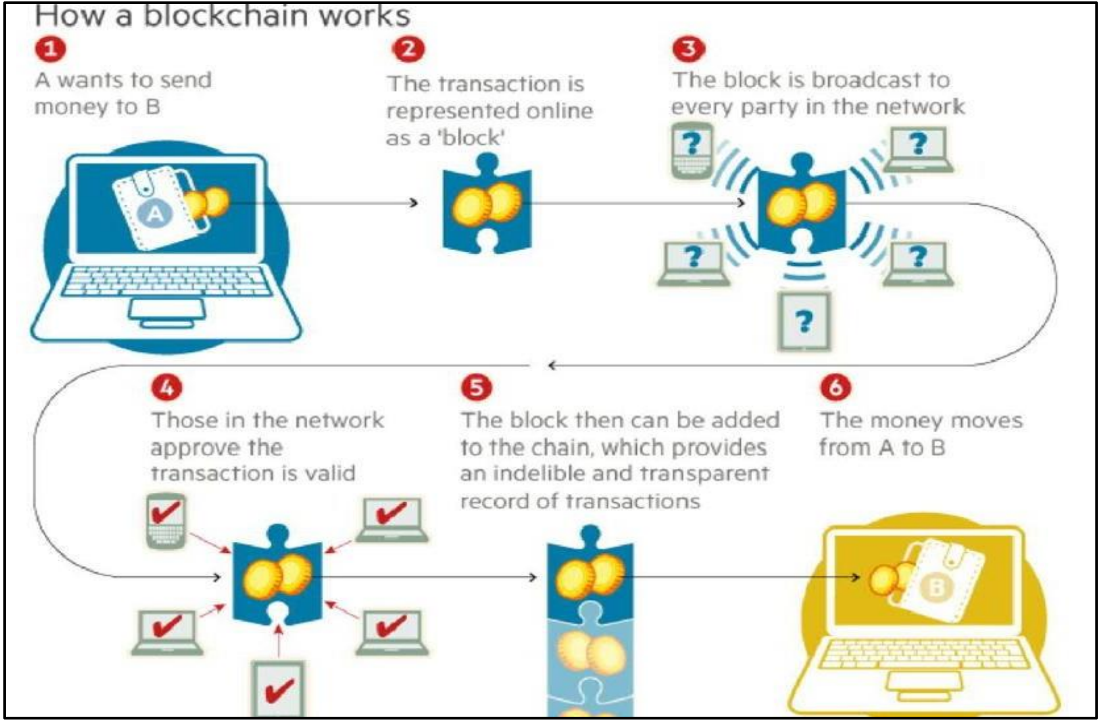
A set of blocks in a certain order.

- **Miners**

Before adding anything to the Blockchain structure, particular nodes do block verification.

The following Blockchain architecture diagram shows how this works in the form of a digital wallet.

Figure 4.3: Financial Transactions using the Block Chain Technology.


How a blockchain works
1
A wants to send money to B
2
The transaction is represented online as a 'block'
3
The block is broadcast to every party in the network
4
Those in the network approve the transaction is valid
5
The block then can be added to the chain, which provides an indelible and transparent record of transactions
6
The money moves from A to B
A
B

Let us understand in depth what **Block** means in Blockchain.

- This are the certain blocks that consist in each blockchain.

Certain block The hash of the block

↓

The hash from the previous block

↓

The different type of Blockchain determine the kind of data will be stored in each block. For instance, in the Bit coin blockchain structure, the block maintains data about the receiver, sender, and the number of coins.

A hash is similar to a fingerprint (long record consisting of some digits and letters). A cryptographic hash algorithm is used to create each block hash (SHA 256). As a result, it is easier to identify each block in a blockchain framework. A hash is immediately attached to a block when it is generated, and any modifications made to a block effect the change of a hash as well. Simply said, hashes aid in the detection of changes in blocks.The hash from the previous block is the block's last element. This generates a chain of blocks and is the primary component of blockchain architecture's security. Block 45, for example, points to block 46. All confirmed and approved blocks are generated from the genesis block, which is the initial block in a chain.

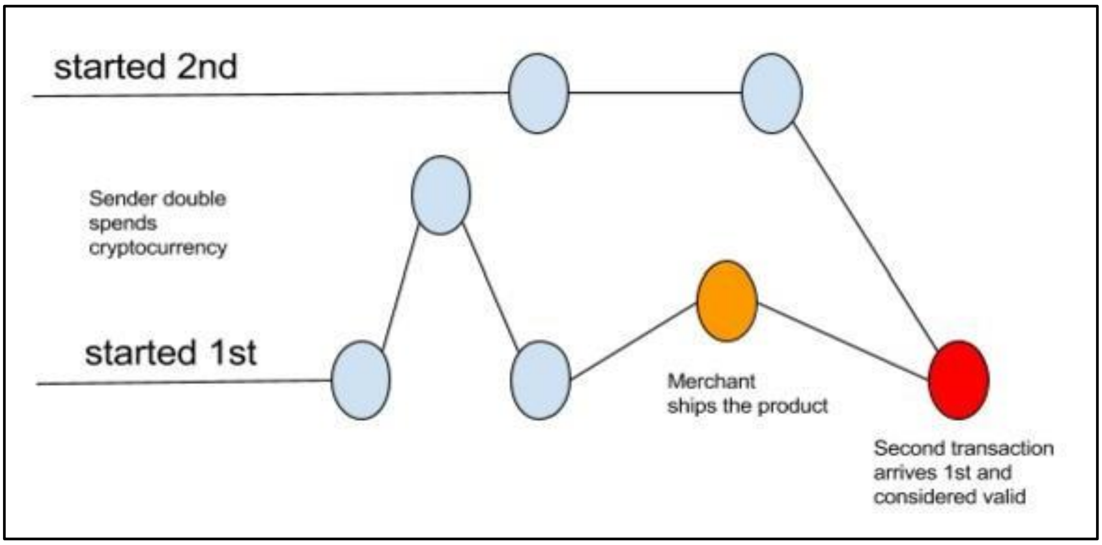

started 2nd
Sender double spends cryptocurrency
started 1st
Merchant ships the product
Second transaction arrives 1st and considered valid

Figure 4.4: Double spending due to propagation delays in peer-to-peer network

As explained above the application works reliably but still remains one more problem: Here any node in the network can collect unconfirmed transactions and create a block and then broadcast it to the rest of the network as a suggestion as to which block should be the next one in the blockchain. Sohow does the network can decide which block should be next in the block chain? There can be multiple blocks created by different nodes at the same time. One can’t rely on the order since blocks can arrive at different orders at different points in the network.

There is a solution for the problem in the blockchain by introducing a mathematical puzzle. All blocks will be accepted in the blockchain provided it contains an answer to a very special mathematical problem. This is also called as "proof of work": to solve a mathematical puzzle a node generating a block needs to prove that it has put enough computing recourses. For case, a node can be required to find a "nonce" which when hashed with both transactions and hashes of previous blocks produces a hash with certain number of leading zeros.

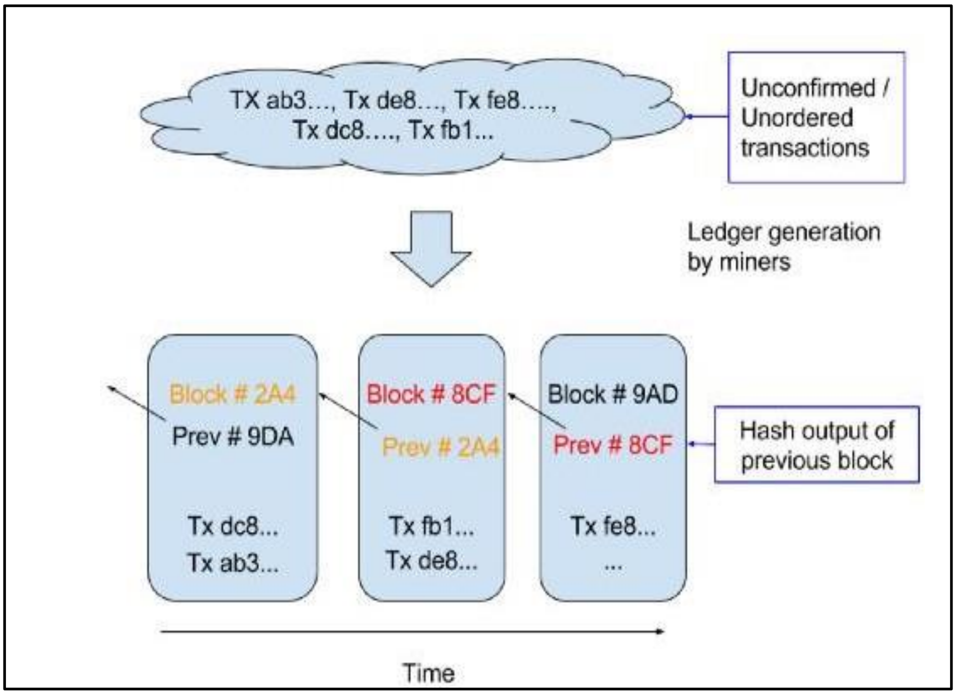


Figure 4.5: Generation of Blockchain from unordered transactions

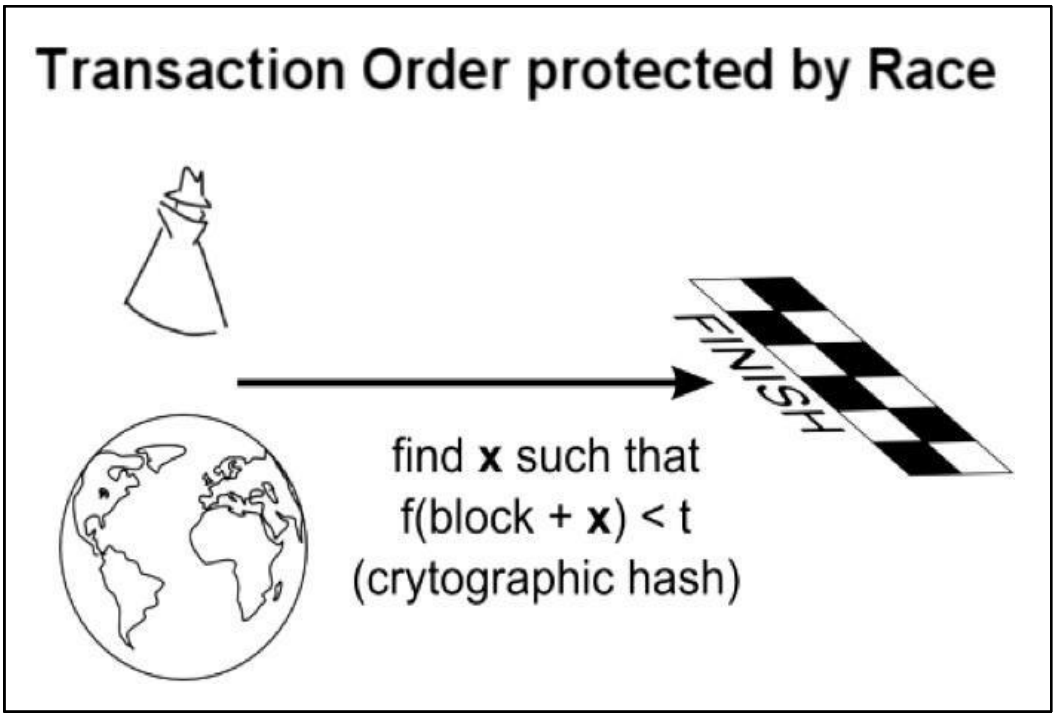


Figure 4.6: Mathematical race to protect transactions – I4

As explained above,mathematical puzzle is not trivial to solve and the difficulty of the problem can be adjusted so that on an average it takes just ten minutes for a node in the b itcoin network to make a right guess and generate a block correctly. There is a very small probability that more than one block will be generated in the system at a given time. The first node, to solve the problem, broadcasts the block to the rest of the network.Frequently, however, more than one block will be solved at the same time, which leads to several possible branches.

However, the math needed to be solved is a very problematical and hence the blockchain quickly stabilizes: after this, every node is in agreement about the ordering of blocks. The nodes are donating their computing resources to solve the mathematical puzzle and generates blocks are called ―miner‖ nodes‖ and are financially awarded for their efforts.

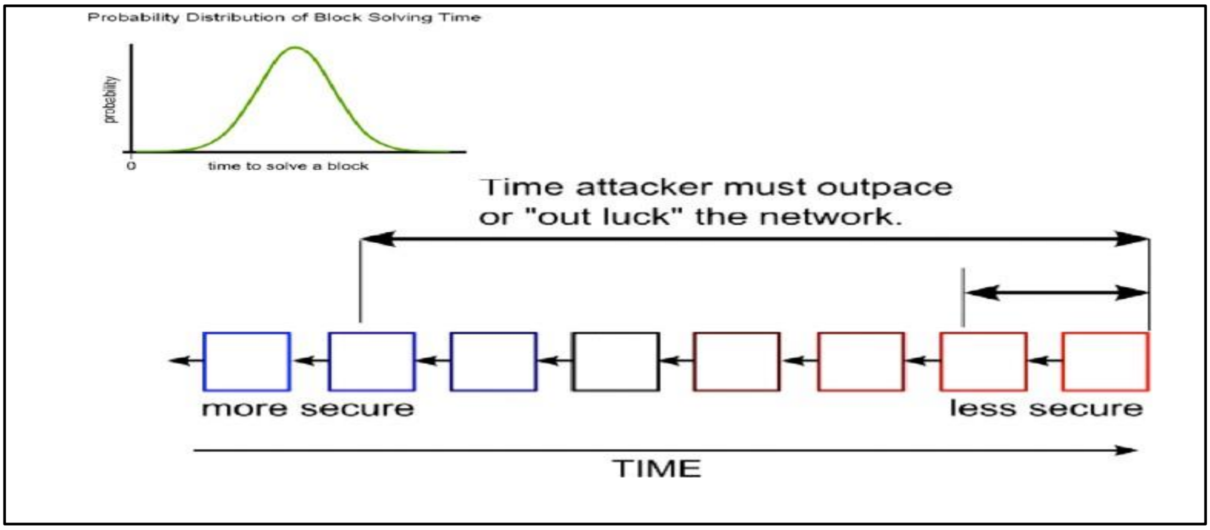

Probability Distribution of Block Solving Time
probability
0
time to solve a block
Time attacker must outpace
or "out luck" the network.
more secure
less secure
TIME

Figure 4.7: Mathematical race to protect transactions – II4

The network only accepts the valid one,the longest blockchain.Therefore, it is next to impossible for an attacker to introduce a fraudulent transaction since it has not only to generate a block by solving a mathematical puzzle, other than it also has to race mathematically against the good nodes to generate all subsequent blocks in order for it to make the other nodes in the network accept its transaction and block as the valid one. Also, this job becomes even more difficult because blocks in the Blockchain are linked cryptographically together.

5.0 Crypto currency

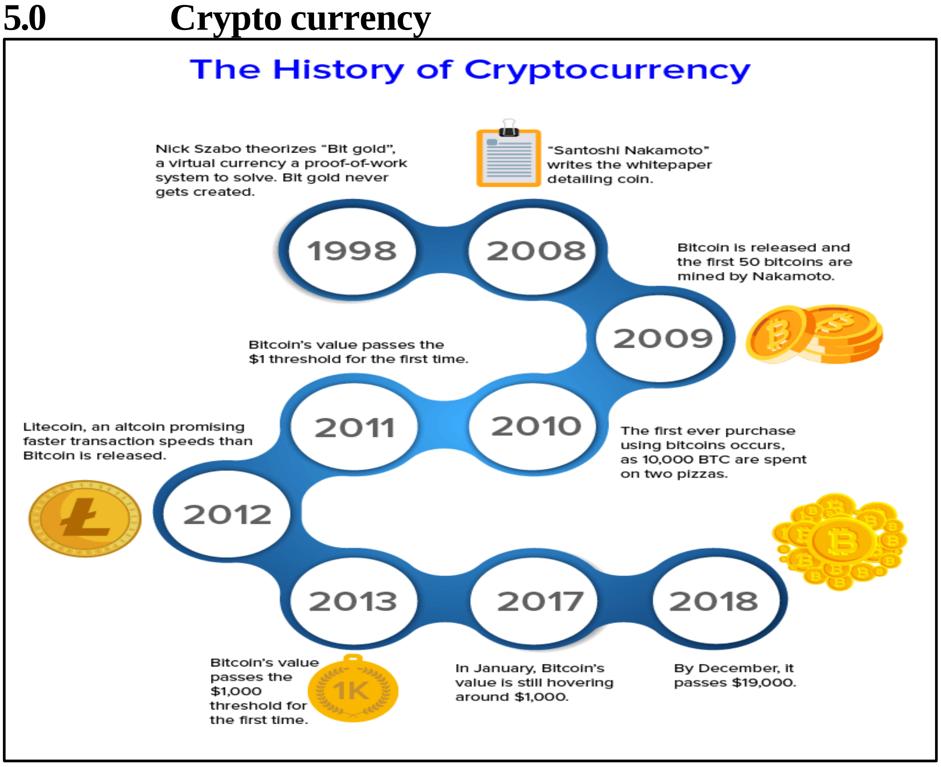

The History of Cryptocurrency
Nick Szabo theorizes "Bit gold", a virtual currency a proof-of-work system to solve. Bit gold never gets created.
"Santoshi Nakamoto" writes the whitepaper detailing coin.
1998
2008
Bitcoin is released and the first 50 bitcoins are mined by Nakamoto.
2009
Bitcoin's value passes the $1 threshold for the first time.
2011
2010
Litecoin, an altcoin promising faster transaction speeds than Bitcoin is released.
The first ever purchase using bitcoins occurs, as 10,000 BTC are spent on two pizzas.
2012
2013
2017
2018
Bitcoin's value passes the $1,000 threshold for the first time.
1K
In January, Bitcoin's value is still hovering around $1,000.
By December, it passes $19,000.

Figure 5.1: History of Crypto Currency

A crypto currency is a digital currency or alternative payment method was created by using encryption methods. Crypto currencies may act as a form of payment as well as a virtual accounting system due to the usage of encryption technology. A crypto currency wallet is necessary in order to utilize crypto currencies. These wallets may be PC or mobile device software that is kept locally or in the cloud. Your encryption keys—which serve as a means of identification and a connection to your crypto currency—are kept in your wallets.

The crypto currencyor crypto is a digital currency designed to work as a medium of exchange throughoutcomputer network that is not a reliant on any central authority, such as a government or bank, to uphold or maintain it. Crypto is a decentralized system for verifying that the parties to the transaction have a money that they claim to have, eliminating the need for a traditional intermediary, such as a bank, when funds are being transferred between two entities.

A Individual coins ownership records are stored in a digital ledger, which is a computerized database using strong cryptography to secure transaction records. This helps to control the creation of additional coins, and to verify the transfer of coin ownership. in spite of their name, crypto currencies are not considered to be currencies in the traditional sense and while varying treatments had been applied to them, including classification as commodities, securities, as well as currencies, the crypto currencies are generally viewed as a distinct asset class in practice. Several crypto schemes use valuators to maintain the crypto currency. In a proof-of-stake model, owners are put up their tokens as collateral. In return, they get authority over the token in proportion to the amount they stake. normally, these token stakes get additional ownership in the token over time via network fees, newly minted tokens or other such reward mechanisms.

5.1 Crypto Currency Transaction Method

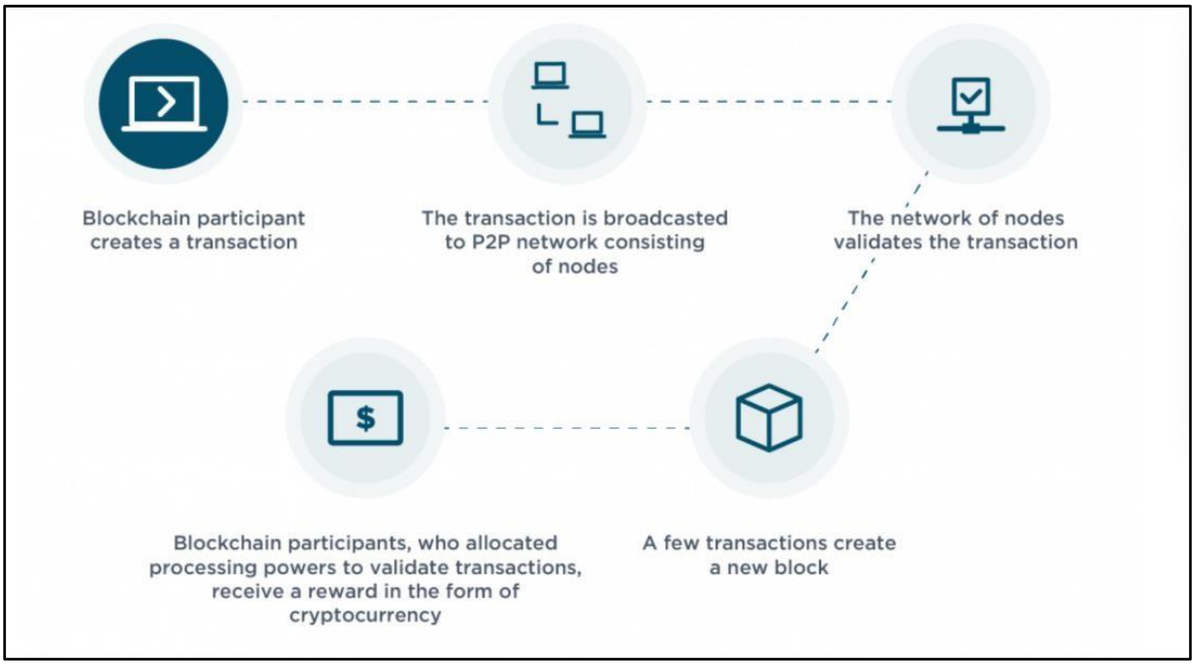

Blockchain participant creates a transaction
The transaction is broadcasted to P2P network consisting of nodes
The network of nodes validates the transaction
A few transactions create a new block
Blockchain participants, who allocated processing powers to validate transactions, receive a reward in the form of cryptocurrency

Figure 5.2:Financial Transactions using Crypto Currency technology

As we previously indicated, Crypto currency is a crucial component of DLT, which is based on consensus algorithms that control the addition of new blocks.

- The date, time, and amount of a transaction are all stored in blocks.
- The machine known as a node is in charge of generating blocks and adding them to the block chain.

Every new block that is put to the end of the Blockchain must first be confirmed by all nodes for the distributed ledger to work. Every time a new block is formed, crypto currency is distributed as a reward for network users who participate in the consensus processes and close blocks.The fundamental goal of incentives is to give users that take part in Blockchain transactions a particular amount of credit as compensation. This promotes collaboration across intermediary nodes and communities, enabling value generation for the blockchain platform.

5.2. The application of Blockchain in crypto currency

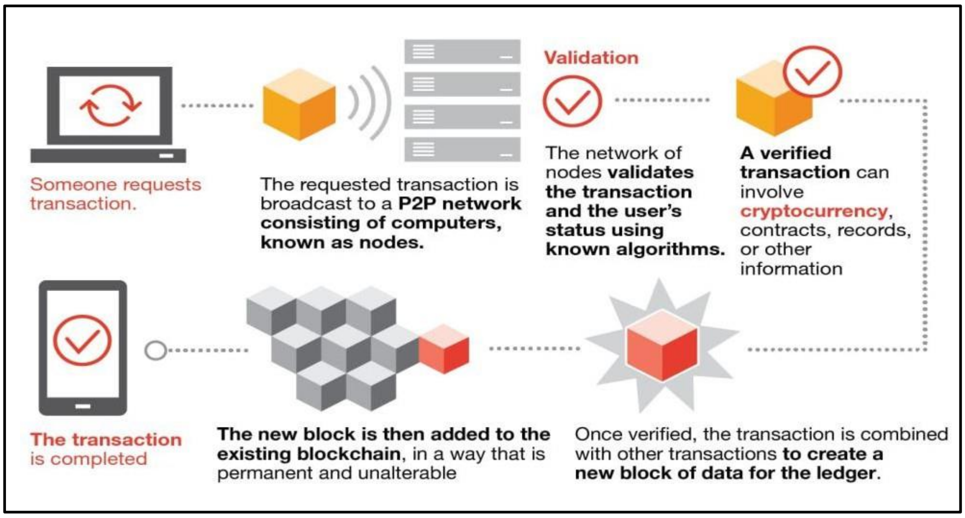

Someone requests transaction.
The requested transaction is broadcast to a P2P network consisting of computers, known as nodes.
Validation
The network of nodes validates the transaction and the user's status using known algorithms.
A verified transaction can involve cryptocurrency, contracts, records, or other information
The transaction is completed
The new block is then added to the existing blockchain, in a way that is permanent and unalterable
Once verified, the transaction is combined with other transactions to create a new block of data for the ledger.

Figure 5.3:Application of Blockchain technology in Crypto Currency

Crypto currency is possible only because of Blockchain —which has a market valuation in the billions of dollars—possible. In particular, Satoshi Nakamoto, a programmer, proposed the bit coin, which is based on cryptographic methods that enable the recipient to receive money securely/truly without needing a trusted third party, such a bank or a business like Pay tm. A new block is created by running a consensus method like Proof-of-Work on the Blockchain, which is the foundation of the Bit coin network.

In 2009, Bitcoin, a distributed ledger-based crypto currency system, became the first blockchain application. As a result, Bit coin became the first "Blockchain."Both entities came together because of the blockchain feature that is being utilized to store this new digital currency, which helped them gain rapidly. The Bit coincrypto currency only defines the currency itself, whereas the Bit coin blockchain only explains the technology that houses the currency.

It has been noted in that it is practically impossible to get the someone's private key from his/her public key which prevents users from impersonating attacks. To do a transaction, the Bit coin client software performs mathematical operation to combine the recipient's public key and sender's (i.e., your own) private key along with the amount of Bitcoin that you want to pay/ send. Then the transaction is sent out to distributeBitcoin network so as to verify by Bit coin software clients/ users other than the sender and recipient. All Bitcoin users that are on- line- other than sender and recipient--check whether a true owner sent the money by exploiting mathematical relationship between its public and private keys; the public transaction log stored on the computer of every Bit coin user to make sure that sender has the Bitcoin to spend.

6.0 Blockchain Technology – Present Status

The Blockchain technology is a finding applications in both financial and non-financial areas that traditionally relied on a third trusted online entity to validate and safeguard online transactions of digital assets. There was another application like ―Smart Contracts‖ that was invented in year 1994 by N ick Szabo. It was an great idea to automatically execute contracts be- tween participating parties. However, it did not find the usage until the notion of crypto currencies or programmable payments came into existence. Now both the programs, Blockchain and Smart Contracts can work together to trigger payments when a pre-programmed condition of a contractual agreement is triggered. Smart Contracts are really the killer application of the crypto currency world.

Smart Contracts: It is acontract, which are automatically enforced by computer protocol. Using the Blockchain technology has made it much easier to register, verify and execute them. In addition, open source companies like Ethereum and Codius are already enabling Smart Con- tracts using Blockchain technology and many companies which operate on bitcoin and blockchain technologies are beginning to support Smart Contracts. In many cases where assets are transferred only after meeting certain conditions, which require Lawyers to create a contract and Banks to provide Escrow services, can be replaced by Smart Contracts.

Alternative Blockchains: The system of using the blockchain algorithm to achieve distributed consent on a particular digital asset. A system may share miners with a parent network such as Bitcoin’s, which is called merged mining.

Coloured Coins: The open-source protocol that describes a class of methods for developers to create the digital assets on top of Bitcoin Blockchain by using its functionalities beyond digital currency.

6.1 Crypto currencies

The following indicates the currencies other than bitcoin:

1. Ethereum (ETH)

2. Tether (USDT)

3. USD Coin (USDC)

4. Binance Coin

5. Binance USD (BUSD)

The Companies such as IBM, Samsung, Overstock, Amazon, UBS, Citi, E-bay, and Verizon Wireless, to name a few, are all exploring alternative and novel uses of the blockchain for their own applications. World's biggest banks including Barclays and Goldman Sachs5 have recently joined forces with the New York based financial technology firm R3 in September 2015 in or- der to create a framework for using the blockchain technology in the financial market. For the first time banks have come to work together to find applications of blockchain technology. The leading banks like JPMorgan, State Street, UBS, Royal Bank of Scotland, Credit Suisse, BBVA and Commonwealth Bank of Australia have joined this initiative.

7.0 Applications

The Blockchain application isCompelling Cases in both Financial and Non-Financial Areas are as follows:

Application of blockchain in financial areas.

- **Cross-border transaction**

Blockchain has the potential to make international transactions more efficient, precise, and affordable.Cross-border transactions: Due to the fact that systems often transit through several banks en route to the payment's final destination, cross-border money transfers have historically been delayed andcostly.

- **Trade finance platforms**

Another Blockchain use in finance to watch is trade finance. Blockchain trade finance platforms arebeing used by several institutions to establish smart contracts between participants, boostingefficiency and transparency and creating new income opportunities.

- **Clearing and settlements**

Block chain's precise recording capabilities may one day render the existing clearing and settlementprocesses unnecessary, resulting in quicker transactions and lower costs for financial institutions.

- **Digital identity verification**Banks and other financial organizations may now identify people by utilizing blockchain-enabled IDs.When client identifying information is protected via blockchain, banks may boost public confidencewhile thwarting fraud and vastly accelerating the verification process.

- **Credit reporting**Consumer financial life are significantly impacted by credit reports. Recent data breaches show thatblockchain-based credit reporting is more secure than traditional server-based reporting. Blockchainmay potentially make it possible for businesses to calculate credit ratings by include non-traditionalelements.Application of blockchain in non-financial areas.

- **Blockchain in Healthcare**

Every day, the healthcare sector produces terabytes of data, including information on patients,payment information, and clinical trial findings. For healthcare professionals, storing, transferring,and safeguarding this kind of data is essential. It might be difficult to manage and reconcile data fromseveral sources.

- **Blockchain in government services**

Due to the technology's ability to provide smooth and secure data interchange, storage, and registry,blockchain has emerged as the essential instrument to support such projects. Important informationmay be smoothly communicated in an open and secure environment while yet being available to theentire public. For example –record keeping, digital identity management.

- **Blockchain in the energy industry**

Blockchain has been used in several locations throughout the world to test peer-to-peer power tradinginitiatives. Higher visibility is made possible by technology, which also makes it possible to track andmonitor all energy exchange transactions between various companies. Blockchain's technologicalfeatures also encourage more confidence and lessen the necessity for a centralized authority ormiddlemen throughout the power exchange process.

- **Blockchain in insurance**

Insurance data comes in two flavours: static, which refers to all records of information, and dynamic,which refers to transactions that should be handled by both customers and insurance providers. Theprimary criterion for this data is that it must be accessible on the knocker, among other things. Thesecircumstances demand the development of a robust and secure system that could handle all of thisdata in an appropriate manner. Fortunately, the blockchain is such a system already.

- **Blockchain in telecom**

The telecom industry remained outside of the blockchain scene, observing with merely curious eyeshow the "fancy" technology was taking hold in other sectors. It is already clear that the telecomindustry is becoming increasingly interested in "distributed ledgers," a catchall term for many types ofblock chains.

8.0 Conclusion

The Block Chain is a Crypto currency backbone technology. The distributed led ger functionality coupled with the security of Block Chain makes it a very smart technology to solve the current financial as well as non- financial industry problems. The Blockchain technology could be quite balancing in a possibility space for the future world that includes both centralized and decentralized models. Any new technology, the blockchain is an idea that initially disrupts, and over time it could promote the developme nt of a larger ecosystem that includes both the old way and the new innovation. The application of blockchain in both financial and non-financial have made things easy, but it is still present in some challenges, such that to have enough financial to pay its implementation and maintenance. For which the technology leader of the world is doing continuous effort to bring this invention in human and the computer world in efficiency way. The only obstacle left after the introduction of blockchain in the life is the obstacle of user acceptance for a better future in a world where the rates of fraud are rising every single day.

The **Block chain Market** value was $4.9 billion in 2021 and projected to reach $67.4 billion by 2026, at a Compound Annual Growth Rate (CAGR) of 68.4% during the forecast period. The major driving factors contributing to the high growth rate of Blockchain Market include increasing venture capital funding and investment in blockchain technology; extensive use of blockchain solutions in banking and cyber security; high adoption of blockchain solutions for payment, smart contracts, and digital identities; and rising government initiatives. There are now **more than 12,000** crypto currencies, and what's truly astonishing is the growth rate. The number of crypto currencies more than doubled from 2021 to 2022. At the end of 2021, the market was adding about 1,000 new crypto currencies every month.

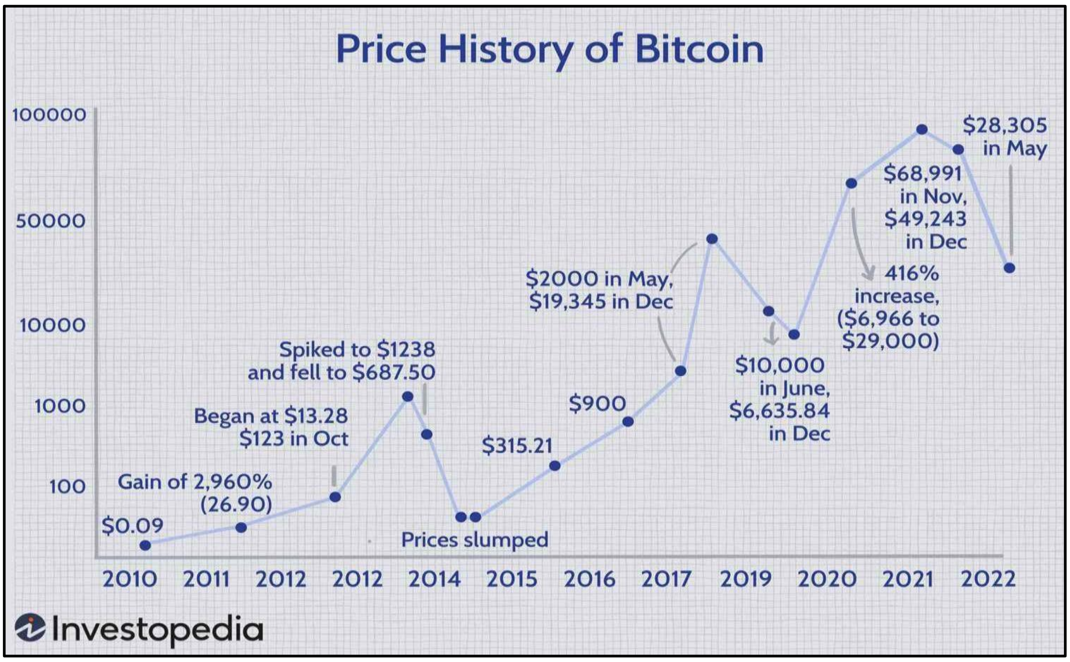
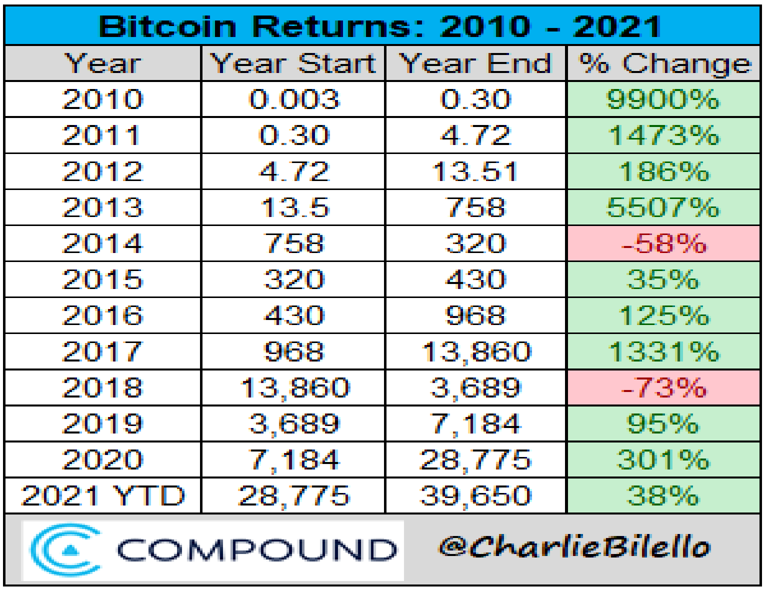


Figure 8.1:Bitcoin price history from 2010-2022 (source – Investopedia website)

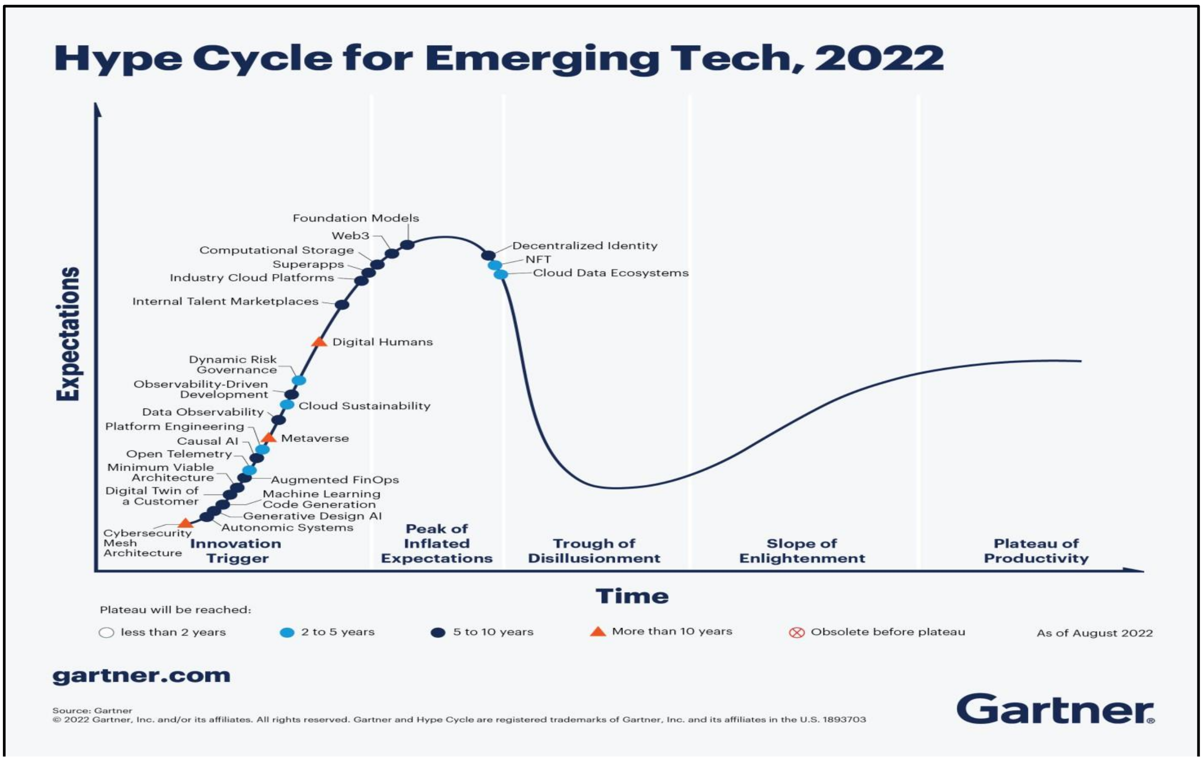


Bitcoin Returns: 2010 - 2021			
Year	Year Start	Year End	% Change
2010	0.003	0.30	9900%
2011	0.30	4.72	1473%
2012	4.72	13.51	186%
2013	13.5	758	5507%
2014	758	320	-58%
2015	320	430	35%
2016	430	968	125%
2017	968	13,860	1331%
2018	13,860	3,689	-73%
2019	3,689	7,184	95%
2020	7,184	28,775	301%
2021 YTD	28,775	39,650	38%

COMPOUND @CharlieBilello

Figure 8.2:Bitcoin Returns from 2010-2021

There is an enormous interest in Blockchain based business applications and numerous start-ups working on them. Adoption definitely faces strong headwind as described before. Even the large financial institutions such as Visa, MasterCard, Banks, and NASDAQ, are investing in exploring applications of current business models on BlockChain. Most of them are searching for new business models in the world of Blockchain. The Block chain technology is going through slow adoption due to the risks associated in the technology. The start-ups are saying like we should be seeing significant adoption in a decade or two.



Source: Gartner
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Figure 8.3: VC Showing crypto currencies in the trough of disillusionment in Gartner's Hype Cycle.

As much as the technology is concerned, the crypto currency-based technology is either in the downward slope of inflated expectations or in trough of disillusionment as shown in Figure 8.3

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