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Blockchain Technology in Modern Days and Future

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ABSTRACT:

Blockchain is a distributed ledger that is decentralized and used to store digital transactions and track digital assets. The blockchain term immutable ledger means that once any transaction is recorded, it cannot be manipulated or changed in any way. Blockchain's name comes from its structure, where a file consists of data blocks and each block is linked to the previous block, forming a chain. Each block contains transaction records or data records and contains a record of when that block was created or modified. Blockchain is designed to promote transparency, speed, reliability, efficiency and reliability in P2P and automated transactions.

This topic examines the possibilities of using Blockchain technology in project management situations and in different sectors, creates a model mark and explains what the most important advantages of Blockchain technology and its future are. In addition, we will see the main concepts and functions related to some of its main components, such as Bitcoin, smart contracts such as Ethereum, private distributed ledgers, etc. Blockchain technology is a new way to record transactions. It keeps these records, called blocks, in different databases, which we often call a digital ledger. We will see how Blockchain works, and one aspect of its use is in the form of tokens.

The main idea behind this topic is that Blockchain technology has begun to conquer modern technology. So to explore how blockchain technology works today and what services Blockchain technology has, we will be understanding the different versions of Blockchain to get enough knowledge about how Blockchain works in the digital world. The study has created a block with the specified Hash function and executed it to create a blockchain. To deepen the understanding with Blockchain, this study shows how encryption tokens work in a Blockchain environment and will be creating a token sample that provides one of the most important uses of Blockchain technology today to represent tokenomics. This study also suggest the use of Blockchain usages in the project management sectors and its advantages that will revolutionize the future of working scenarios in different projects and clients.

KEYWORDS: Blockchain, Tokenomics, Digital Assets, Transaction, Hash, Bitcoin, Encryption, Blocks, Data

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Abbreviations

DAO – Decentralized Autonomous Organization

PoS – Proof of Stake

PoA – Proof of Authority

PoB – Proof of Burn

PoD – Proof of Developer

SATS –Satoshis

BTC – Bitcoin

EVM – Ethereum Virtual Machine

P2P – Peer to Peer

ICO – Initial Coin Offering

ITO – Initial Token Offering

LN – Lightning Network

NONCE – Number Used Only Once

MCAP – Market Capitalization

IPFS – Interplanetary Files System

EEA – Enterprise Ethereum Alliance

CFTC –Commodity Futures Trading Commission

Pow – Proof of Work

FA – Fundamental Analysis

Bech32 – Bitcoin address format

MACD – Moving Average Convergence Divergence

SC –Smart Contract

BFT – Byzantine Fault Tolerance

DPoS –Delegated Proof of Stake

DAPP –Decentralized Application

MoE – Medium of Exchange

ASIC –Application Specific Integrated Circuit

GDPR –General Data Protection Regulation

ALT – Alternative Cryptocurrency

TPS – Transactions Per Second

SegWit – Segregated Witness

STO – Securities Token Offering

PnD – Pump-and-Dump

SoV – Store of value

OTC – Over the Counter

2FA –Two Factor Authentication

UoA – Unit of Account

PKI – Public Key Infrastructure

ERC – Ethereum Request for Comments

DLT – Distributed Ledger Technology

DDoS – Distributed Denial of Service

DEX – Decentralized Exchange

Tx –Transaction

BTM – Automatic Teller Machine for Bitcoin

DAG – Directed Acyclic Graph

TA – Technical Analysis or Trend Analysis

UTC – Coordinated Universal Time

AML – Anti Money Laundering

AMA –Ask Me Anything

UoA – Unit of Account

TA – Technical Analysis

SEC – Securities and Exchange Commission

AML – Anti-Money Laundering

GPU – Graphical Processing Unit

IPFS – Interplanetary Files System

PKI – Public Key Infrastructure

Multi-sig – multi-Signature

BIP – Bitcoin Improvement Proposal

CEX – Centralized Exchange

Addy – Address

API – Application Programming Interface

ASIC – Application Specific Integrated Circuit

BFA – Brute Force Attack

MoE – Medium of Exchange

SHA-256 – Secure Hash Acronym (256-bit)

WWDC – Worldwide Developers Conference

ERC-721 – Token standard for NFT (non-fungible tokens)

ETF – Exchange-Traded Fund

ETP – Exchange-Traded Product

FIAT – Conventional government-issued currency (e.g. US Dollar, Euro)

IBO – Initial Bounty Offering

ICO – Initial Coin Offering

ITO – Initial Token Offering

mBTC – Milli bitcoin

CMC – Coinmarketcap

DAICO – Decentralized Autonomous Initial Coin Offering

DCA – Dollar Cost Averaging

Defi – Decentralized Finance

DEX – Decentralized Exchange

DLT – Distributed Ledger Technology

SEC – Securities and Exchange Commission

FTC – Federal Trade Commission

CFTC – Commodity Futures Trading Commission

FDIC – Federal Deposit Insurance Corporation

DOJ – Department of Justice

1 Introduction

In a research project in 1991 (Haber & Storneta, 1991), the idea of blockchain was created before it was used widely with Bitcoin in 2009. Since then, the use of blockchains has greatly increased with the development of many cryptocurrencies, decentralized finance (Defi) apps, non-fungible tokens (NFTs), and smart contracts. As we know in the BTC white paper, it was Bitcoin pseudonym developer Satoshi Nakamoto who gave an overview of blockchain in 2009 while the ideas flowing into it were swirling in the computer science community. Since then, blockchain has been used in many other areas, but in a sense, it was designed specifically for this digital currency and to further advance its digital currency goals.

The blocks are linked together through a complex cryptographic verification process to form an immutable chain. In its early form, blockchain technology established many of the core features of these systems that continue to exist today. The Bitcoin blockchain hasn't changed much since those early efforts (Anwar, Anayat, Butt, & Saad, 2020).

Over time, developers began to believe that a blockchain could do more than just transact documents. For example, the founders of Ethereum in 2013 started floating the idea that assets and trust agreements can also benefit from blockchain management by generating transaction gas fees and sales of block space. With time the Usages of Blockchain technology is rising and being used in different fields, one of the widely used sectors of blockchain is a cryptographic token or decentralized token that is used as a digital currency with a certain value according to the user and the market. Some of them even hit billion-dollar market caps. Along with the development, there comes many new innovative ideas and challenges and mostly the challenges in the world of computing technology are security. So, to overcome the security concern in the world of blockchain Hash functions are used to generate a unique digital signature that makes it almost impossible to hack or breach the information, and blockchain itself is irreversible, which makes it a secure means to be used.

Blockchain technology is constantly progressing and constantly changing its form with the newer version of it and its usage. New changes include the smart contract and usage of SHA-3, the latest one come into play for possible securing the blockchain network

before accessing by creating digital signatures in the blockchain. Blockchain is the new progress in computing technology in this decade and should be more secure and reliable for the user to carry out any transaction through the block. It also uses the private and the public key to carry the transaction in the blockchain where the public encrypted key is presented to the public but the private key is kept safe and secure where only the user can access it that leading to the transaction being secure as the third-party can't know the main private key as it is not visible, only the public key is given and it's hard to retrieve the private key through the public.

Engineers began to believe that blockchain would do more than document transactions. For example, the founders of Ethereum have suggested that trust and property contracts could benefit from blockchain management. In this way, the second generation of blockchain technology is represented, an innovative technology that has miraculously impacted various industries was introduced to the market with the first modern application of Bitcoin. Bitcoin is simply a form of digital currency (cryptocurrency) that can be used for transactions instead of fiat money, so the technology behind the success of cryptocurrencies is known as blockchain. A mysterious person named Satoshi Nakamoto published a white paper in October 2008 and called it Bitcoin, a peer-to-peer electronic money system on an Internet mailing list. He has been recognized as mysterious because he hasn't yet revealed his real identity and is only known through his name from bitcoin white paper. So blockchain was first introduced in 2008 as a ledger of bitcoin transactions. Since then, technology has never looked back and has made leaps and bounds. In January 2009, Nakamoto released Bitcoin software version 0.1 with source code. Slowly, the concept took over as a digital product and began to trade real-value goods and services. Hal Finney, who first came up with the concept of cryptocurrencies, first proposed the idea of money production while solving computer problems in 2005. The most famous example in this category is Bitcoin. It is used as Internet money and is considered the main promoter of Internet money. The DLT concept inspired the original Blockchain generation, Blockchain 1.0. A distributed ledger is a database that is shared by many people in a consensus, allowing public witnesses to avoid double spending. The most famous application of DLT was cryptocurrency, in which Bitcoin played a major role. As a

result, Bitcoin became known as "Internet money" and paved the way for the "Internet of Money".

1.1 Problem Statement and Research Gap

Even though more people are interested in blockchain technology, using it in project management is still not well studied, and there are many areas that need more research. Most studies talk about the benefits of blockchain, like being clear, safe, and not controlled by one person. However, there isn't much real-world proof of how well it works and how it affects projects. Also, while fields like finance and supply chain management have started using blockchain a lot, research on using it in project management is still just beginning. There are big gaps in knowing the real problems of using blockchain. These problems include high costs to set up, rules and regulations, difficulty in connecting with other systems, and companies being hesitant to change. Also, there isn't a set way or best methods for using blockchain in project management. This makes it hard for businesses to use this technology effectively.

Another important area that needs more study is how smart contracts are used in carrying out projects. Smart contracts can help with things like making payments, following rules, and approving tasks automatically. However, there isn't enough research on their problems, legal issues, and how well they work in real life. In the same way, the blockchain could improve risk management in projects haven't been looked at deeply, especially when it comes to boosting trust among stakeholders, keeping data safe, and ensuring responsibility. There are still worries about scalability and performance because current research doesn't clearly explain how blockchain can manage large amounts of project data and many transactions without losing efficiency. Finally, the ongoing effects of blockchain on various areas of project management, like construction, IT, and healthcare, are mostly unknown (Sonmez, Sönmez, & Ahmadisheykhsarmast, 2021). We also don't know much about how it works together with new technologies like AI and the Internet of Things (IoT). Filling in these gaps is important for fully understanding how blockchain is used in todays and future project management.

1.2 Research Questions and Objectives

The research question for this master's thesis is: "*How can blockchain technology make project management clearer and more effective.*"

In addition to the above-mentioned research questions, we also have some sub sections including some extra research questions linked to the above-mentioned research question. They are: What are the main problems and obstacles to using blockchain in project management? How do smart contracts affect how projects are carried out, how decisions are made, and how disagreements are solved? What are the upcoming trends and possible uses of blockchain in managing projects? How does blockchain help in managing risks and build trust among people involved in projects?

By the end of the report, this thesis presents the way of creating a sample token which can be used as a financial solution to the projects. This report also presents why and how blockchain technology is useful for project management. In addition, it also presents the advantages that the project owners will have by using blockchain technology in project management.

1.3 Structure of the Thesis

This thesis has been prepared with six main chapters:

To begin with, Introduction section provides the study background, the problem statement, and the research gaps which is because this research is being done, the research objectives and research questions, and finally the structure of the thesis. The literature review has been processed detailly with the overview of blockchain technology along with how the blockchain is created, it also describes how a sample cryptocurrency token is being created through the same block.

In Detail, the literature review gives a well-studied and implemented process of how a blockchain is created and the same blockchain is used to create a cryptocurrency token which can be used as a medium of financial transactions in project management sectors. Further research explains the challenges that can arise having blockchain in project management and how it can help in improving the project management sector.

Methodology and Data Section provides the data and the views of different personnel regarding blockchain. The distribution of the data has been done in such a way that it has been differentiated according to the view and choice of the surveyors. Data from almost 47 people has been gathered to know their perspective towards having block-chain in project management sectors. All those data had been made a calculation through excel seeing the variance analysis, correlation matrix, etc.

Results sections have all the statistical and empirical calculation done from the answers received from the surveyors.

Note: The data and the calculations done are totally based on the views and perspective of the surveyors. No influence and suggestions have been given from the research to module the research as required or wanted.

Conclusions and Proposals sections has the summary of overall thesis and the results. Proposals have been given from the researchers' view to improving the way project man-agement sectors work to improve the future projects.

Finally, the appendices section has all the questionnaires that surveyors were asked to fill out and give their opinion.

2 Literature Review

2.1 Overview of Blockchain Technology

Blockchain is a distributed ledger that is decentralized and used to store digital transactions and track digital assets. The blockchain term immutable ledger means that once any transaction is recorded, it cannot be manipulated or changed in any way. Blockchain's name comes from its structure, where a file consists of data blocks and each block is linked to the previous block, forming a chain. Each block contains transaction records or data records and contains a record of when that block was created or modified. Blockchain is designed to promote transparency, speed, reliability, efficiency and reliability in P2P and automated transactions.

There is a general misconception that Blockchain and Bitcoin are the same, but that is not the real case. Creating cryptocurrency is one of the main uses of blockchain technology. Besides Bitcoin, there are many other applications made using blockchain. Blockchain 1.0 offers several advantages over traditional payment methods, including low transaction costs and transaction anonymity. Bitcoin will never run out of money because there is enough supply. Bitcoin not only prevents double spending, but also counterfeiting, allowing for secure, traceable, and transparent transactions. The main era of Blockchain uses a proof-of-work (PoW) component, which requires a complex scientific miracle because lot of computer work is needed to randomly solve a rare and tough puzzle that keeps the blockchain safe. Due to its complexity, PoW is very time-consuming and uses a huge amount of vitality, comparable to the overall benefits. In this sense, the acceptance of exchanges is also much more moderate than for electronic channels. Studies show that Blockchain 1.0 can handle up to seven exchanges simultaneously and thus has a significantly reasonable performance. Selfish mining, which is used by conspirators to generate more revenue than their mining capacity, is very vulnerable to Bitcoin. As a result, Bitcoin becomes a centralized system that is completely controlled by these selfish miners. Blockchain 2.0 is coded, the new application works with new protocols ("blockchain 2.0 protocol"). A comparison with the Internet protocols and its stack layer shows the relationship between blockchain 1.0 and blockchain 2.0. The former can be

considered as the TCP/IP transport layer, while the latter can be considered as the HTTP, SMTP and FTP layer. In this context, blockchain 2.0 applications would be similar to browsers, social networks and file sharing services.

Blockchain 2.0 terms distinguish Bitcoin and blockchain as a programmable infrastructure that is a trusted and important asset that defines it precisely with new features of on-chain utility and scalability (Swan, 2015). Rather than seeing blockchain as part of the decentralization of money and payments, blockchain 2.0 expands the scope of the technology to enable the decentralization of markets more generally, and transactions involve other types of assets that provide certificates and registers of rights and obligations. in real estate, intellectual property, cars, works of art, and so on. Blockchain also records this transaction. Ethereum uses Blockchain to create smart contracts. It is a community-developed technology that powers another cryptocurrency, Ether (ETH), which is widely used in areas such as electronic voting, real estate, and commerce. Instead of competing for Bitcoin, Ethereum miners compete for Ether.

After version 2.0, a new version was released that included DApps or Decentralized Apps. DApp is similar to a traditional application in that its user interface can be written in any language that calls the backend, and the backend code runs on a distributed peer-to-peer network. It leverages distributed storage and communication, such as Ethereum Swarm and other similar systems. dApps are Blockchain-based applications or a computer program that communicates with the Blockchain and monitors and controls the state of all the performing artists. Programs based on blockchain, which is not at all similar to centralized applications running on a single computer, run on a peer-to-peer network. Unlike centralized programs that run on centralized servers, such applications use distributed power and communication, and most of their backend code runs on a distributed network. ForkDelta, CryptoKitties, Bancor, Ether Shrimp Cultivate, PoWH 3D, Moon, Inc. and others are among the best dApps.

The two main features of blockchain are immutability and decentralized ness. Since the record is immutable, you are constantly dependent on it for correction. The decentralized nature of the blockchain protects it from organized threats.

2.1.1 Introduction to Blockchain Technology

Blockchain is a system that helps securely transfer assets without needing a middleman. It acts like a tool and a digital record that keeps track of these transfers. Blockchain technology helps information and digital exchanges move easily and safely. You can keep and trade things like money, property titles, and voting rights on a blockchain network. Blockchain technology is like software that acts as a shared record kept across different computers in a network. It is distinguishing from other online trading platforms or databases is immutability. we in another hand we can trade digital assets peer to peer where anyone cannot alter or undo those transactions without the approval of a network that is aligned in the majority. Today, people often compare blockchain to the Internet back in the mid-1990s when it was new and not fully appreciated for its value and possibilities. For example, in a Newsweek article from February 1995, computer expert (Stoll, 1995) said, "That's nonsense. " Are our tech experts missing basic understanding. The reality is that no internet database can replace your daily newspaper, no CD-ROM can substitute for a good teacher, and no computer system will alter how the government operates (Stoll, 1995) .

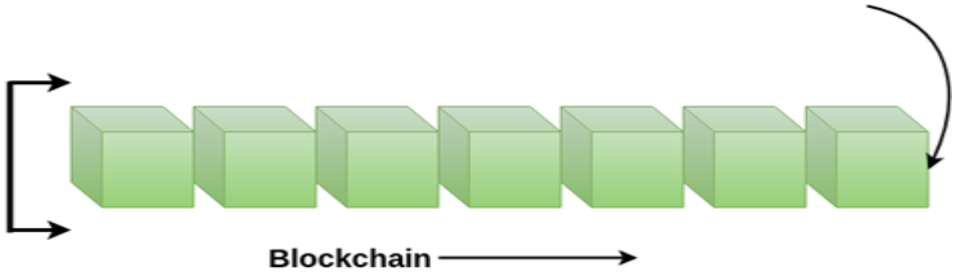


Figure 1 Blockchain with Blocks

In the start, the price of Bitcoin hovered under 10 USD but all of a sudden it started to take a rise by 2013 and reached 100 USD and since then the price has slowly and gradually spiked making Blockchain technology a noticeable technology in the modern world. So, a Blockchain is a shared digital ledger that cannot be tampered with after a transaction has been carried out and verified. This algorithm is used to carry out the recording and the verification process in software and guarantee mathematically that once accepted the detail of the transaction described by the ledger it cannot be altered by

anyone, without the application that has more computing power than currently exist (Benton & Radziwill, 2017).

Blockchain technology can support it quite a bit more than cryptocurrency. A new platform for blockchain technology development is prompting and Blockchain technology now arises with the quality and software quality to maintain the commonplace in the market. Here below we can see a chart showing the Blockchain-based research papers frequently indicating its popularity. So, to conclude the Introduction of Blockchain it is a ledger that is constantly growing and keeps a permanent record of all the available transactions that has been generated in a chronological, secure, and immutable manner. Where Block in the blockchain contains information on all the transactions that are recently carried out and once they are completed it goes to the blockchain as a permanent database. Whenever an old block gets completed, a brand-new block is created. Also, for further information blockchain can be used for the transferring of property, money, contract, and other insecure ways without needing a third-party intermediary like the government or a bank. For note, Blockchain cannot be run without the internet (Yaga, Mell, Roby, & Scarfone, 2018).

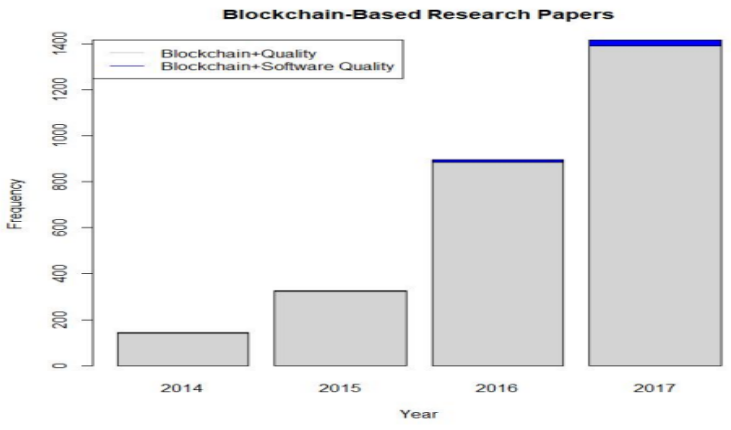


Figure 2 BLOCKCHAIN BASED RESEARCHES BASED ON FREQUENCIES

2.1.2 Evolution of Blockchain Technology

All the new technology that arrives at a particular time is revolutionary but later it is taken for granted. For instance, it was not possible for any credit card but now

technology has been so easily accessible and part of life. The concept of the Merkle tree was introduced back in 1979 by Ralph Merkle. He described the concept with the approach of digital signature and public key distribution and called “Tree Authentication" in this thesis for Stanford University. Later the idea was patented as a method for providing digital signatures. Data structure verification is provided by the Merkel tree (Chen, Chou, & Chou, 2019), later we will discuss this topic in-depth. Merkel’s step was the initial footprint. Later David Chaum explained the vault system in 1982 for maintaining, establishing, and trusting computing by the mutually suspicious group in the Ph.D. He is also given credit for inventing digital cash and founded Digi Cash cooperation in the year 1989. A researcher explained blockchain technology, Scott Stornetta and Stuart Haber in 1991. This scientist wanted to create a way to add time stamps to digital documents. The main reason was to ensure that the documents couldn't be changed or made to look older than they really are. Stuart Haber and W. created safe chains of blocks using strong security methods. Scott Stornetta came up with the idea of using secure time stamps to save documents. In 1992, blockchain technology was improved with something called Merkle Trees. This allows many documents to be grouped together into one block, making it work better. Merkle Trees help to create a safe chain of blocks. They keep a set of connected data records. It is the latest record in this series and has the history of all the previous records. But this technology wasn't used, and its patent ran out in 2004 (Khalil, Aziz, Farooq, & Abid, 2021).

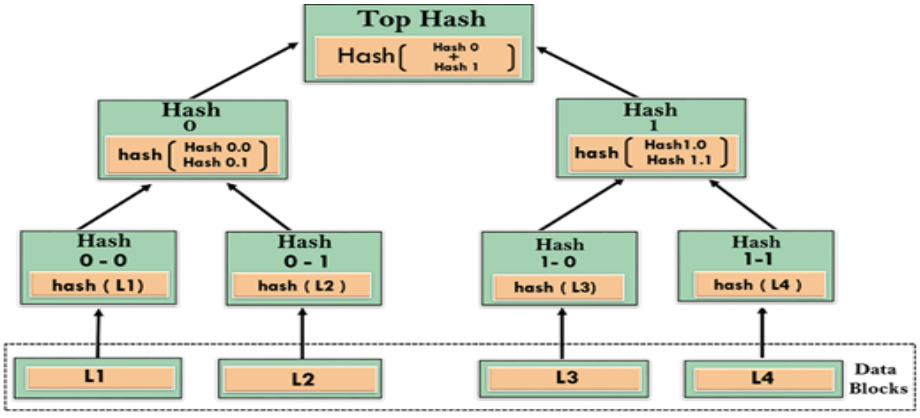


Figure 3 MERKEL TREE

Computer scientist Hal Finney created Reusable Proof of Work (RPoW) in 2004, which was an early step in the development of cryptocurrencies. It was a significant early step in the development of cryptocurrencies. In RPoW, a special type of token that can't be exchanged or replaced was made using a Hash cash proof of work. This token was signed with an RSA signature and could be passed from one person to another. RPoW solved the double-spending issue by keeping track of who owns the tokens on a reliable server. This server was designed so that users all around the globe could verify its integrity and accuracies in real-time. In 2008, Satoshi Nakamoto invented the idea of distributed blockchains. He improved the design for the addition of the blocks to the primary chain having not requiring them to be signed by parties that are trusted. The modified trees would be a secure record of data exchanges. Short Records of Bitcoin build-up are from a concept to reality, bitcoin arrived in 2009. Jan. 3, 2009. Bitcoin was generated by Nakamoto, who validated the blockchain concept through the mining of the first bitcoin block. There were 50 bitcoins in the block, which was called the Genesis block -- or block 0 in the Bitcoin world. Jan. 8, 2009. Bitcoin v0.1 was released to Source Forge as open-source software by Nakamoto. Bitcoin can now be found on GitHub. Jan. 12, 2009. As a result of this transaction, Nakamoto sent Hal Finney 10 bitcoin in block 170 of bitcoin history. Oct. 12, 2009. On Internet Relay Chat, a channel named bitcoin-dev was created for bitcoin developers. Oct. 31, 2009. People were first able to exchange paper money for bitcoins via Bitcoin Market, the first bitcoin exchange. Nov. 22, 2009. To share information and news related to bitcoin, Nakamoto launched the Bitcoin talk forum.

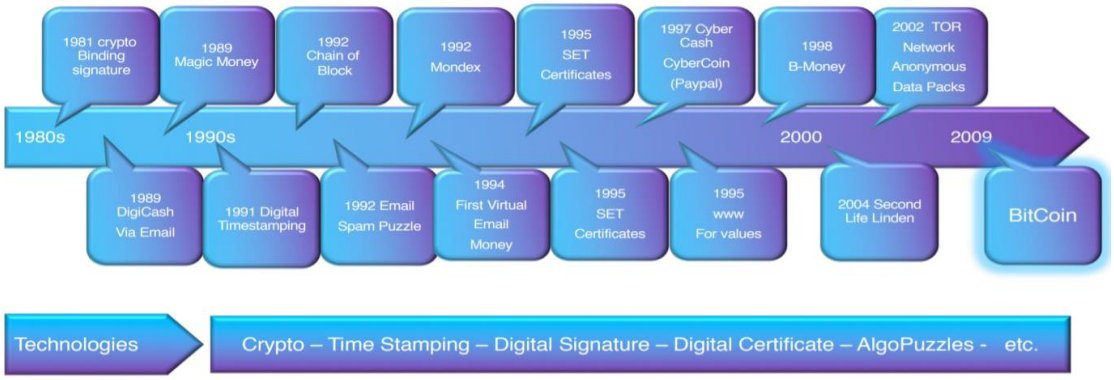


Figure 4 EVOLUTION OF BLOCKCHAIN

It marks the time and checks each trade using a network of connected computers. It can be handled without a main leader or organization. Blockchains are now the main support for cryptocurrencies because of these improvements. Today, the design serves as a public record for all transactions made with cryptocurrency. Blockchains have developed steadily and show a lot of potential. In Satoshi Nakamoto's first paper, the words block and chain were used separately. However, by 2016, people started to use them together to mean Blockchain. The file size of the Bitcoin blockchain, which contains records of all network transactions, has just increased from 20 GB to 100 GB. Blockchain-based technology has been on the rise since the launch of bitcoin in 2009. Aside from their use in cryptocurrencies (the most well-known of which is bitcoin), ideas and efforts to incorporate blockchain into a wide range of businesses and services have been made.

The potential of blockchain to automate trust mechanisms without a central authority (such as a central bank, government, or military) mitigates risk and promotes all manner of efficiency in human interaction, whether formal or informal, incorporated or government contexts. One of these technologies is "smart contracts," which promise to make all kinds of exchanges of goods and services, not just financial ones, easier. A lot of effort is presently being spent on figuring out how to scale blockchain-based systems and how to build them in a way that is far less computationally costly than systems like bitcoin. Moving forward, there is optimism that blockchain-based technology could usher in a new era of efficiency comparable to the internet boom of the last two decades. It is impossible to own blockchain technology because it is the technology that underpins the blockchain. It's like the internet. Anyone, however, can utilize the technology to create and maintain their blockchains. Financial institutions and other industries began to understand and investigate the possibilities of blockchain in 2014, changing their focus from digital money to the development of blockchain technologies.

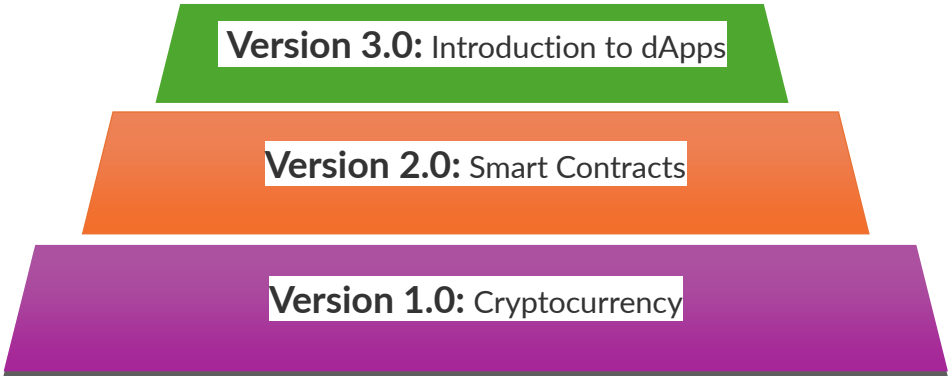
In contrast, the year 2018 marks the tenth anniversary of Bitcoin. Bitcoin's value continued to fall throughout the year, ending the year at around $3,800. Stripe, a popular online payment service, has ceased taking bitcoin payments. Cryptocurrency advertising is prohibited on Google, Twitter, and Facebook. South Korea has outlawed anonymous cryptocurrency trading but has pledged to spend millions on blockchain projects. The

Blockchain Observatory and Forum was founded by the European Commission. Baidu has announced the launch of its blockchain-as-a-service platform. Walmart debuted a Hyperledger-based supply chain system in 2019. Amazon has made its Amazon Managed Blockchain service available to everyone on the AWS platform. Daily transactions on the Ethereum network surpassed one million (Arooj, Umer, & Farooq, 2021). As businesses adopted blockchain technology and decentralized applications for a wide range of applications, blockchain research and development gained center stage. 2020 will be discussed. According to Deloitte's 2020 Global Blockchain Survey, about 40% of respondents had implemented blockchain in their business, and 55% identified blockchain as a major strategic priority. In anticipation of Ethereum 2.0, Ethereum released the Beacon Chain. Because they promised greater stability than regular cryptocurrencies, stable coins witnessed a large increase. The idea of merging blockchain and artificial intelligence to improve corporate processes is gaining traction. There has been a growing interest in using blockchain for applications other than cryptocurrency during the last five years. As governments and businesses seek blockchain for a range of use cases, this trend will continue beyond 2021. Voting, real estate, fitness tracking, intellectual property, the internet of things, and vaccine distribution are among the topics covered. Furthermore, several cloud providers now provide blockchain as a service, and qualified blockchain developers are in higher demand than ever.

2.1.3 Version of Blockchain That is Used

Today's technology has made Blockchain a buzzword. A Blockchain is a digital list of transactions stored in a series of blocks. So far, Blockchain Technology has changed in four main ways. Each change is explained in the sections below. More people are using blockchain technology because it allows transactions and data to be stored in a way that is open and not controlled by anyone or group. Blockchain is mostly linked to bitcoin and other digital currencies. Blockchain technology has been developing since 2009 and is now used for more than just bitcoins and digital money. Users can use the block hash or the block height. The block height is decided by how many blocks there are before it. So, you can find it by taking the block's length and subtracting one. The height of the

latest block, or the tallest block in the chain, is used to find the total height of the whole blockchain. The "Coinbase Transaction" is the name for a miner's very first transaction. Miners use it to get their rewards for each correct answer. The following summary depicts the evolution of blockchain technology, from version 1.0 to version 3.0.



A blockchain is a peer-to-peer (P2P), decentralized, distributed ledger technology with an ever-growing public ledger that securely and immutably records all transactions. Blockchain differs from typical databases in that it is decentralized and completely confidential, as there is no intermediary or mediator.

2.1.3.1 Blockchain Version 1.0 : Cryptocurrency

Hal Finney, who invented the first concept for cryptocurrencies, first proposed the idea of manufacturing money by solving computer problems in 2005. The most well-known example in this category is Bitcoin. It is being utilized as Internet cash and is being viewed as a key enabler of an Internet of Money (Khalil, Aziz, Farooq, & Abid, 2021). The concept of Distributed Ledger Technology (DLT) inspired the initial generation of Blockchain, Blockchain 1.0. A distributed ledger is a database that is shared by numerous people in a consensual manner, allowing public witnesses to avoid double-spending circumstances. The most well-known DLT application was cryptocurrency, with Bitcoin playing a key role. As a result, Bitcoin became known as "internet cash" and opened the path for the "Internet of Money" (Framework for Blockchain-based business integration). We can take a real-life scenario where a Person Parashar wanted to send 1 bitcoin to his friend Bob is Portrayed below

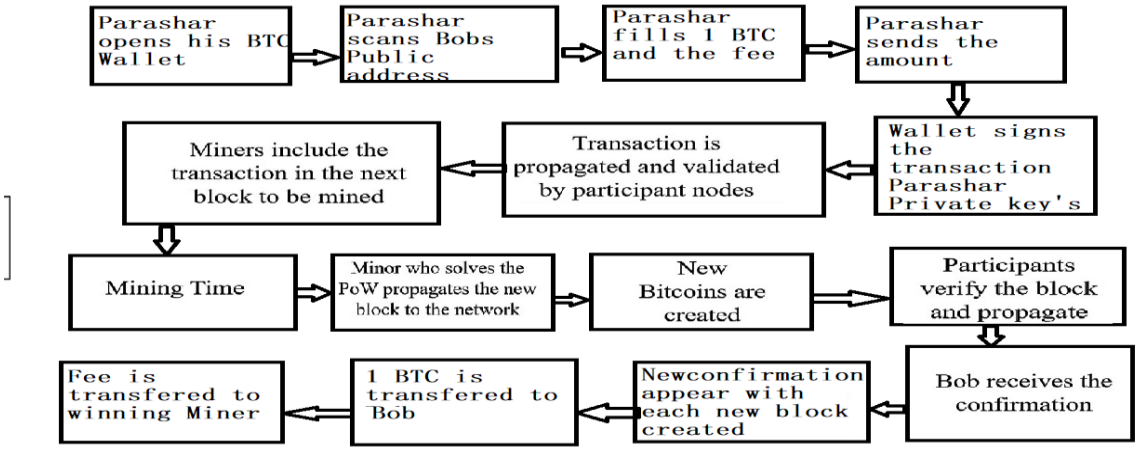


Figure 5 BITCOIN TRANSACTION LIFECYCLE (VERSION 1.0 CRYPTOCURRENCY)

From the Figure above we can see that Person Parashar send his bitcoin through his bitcoin wallet which includes the transaction fee with the private key assigned that is propagated and validated by the participant nodes as the miner include the transaction in the next block to be mined with mining time also the new block is propagated to the network and new bitcoin are created. Participant verify the block and propagated finally the Bob receive the confirmation that appears with each new block and 1 BTC us transferred to bob's wallet. Blockchain 1.0 provides several advantages over traditional payment methods, including cheap transaction costs and transaction anonymity. Bitcoins will never be out of favor because there is a sufficient supply. Bitcoins not only prevent double-spending, but also prevent counterfeiting by allowing for safe, trackable, and transparent transactions. The main era of Blockchain uses the Confirmation of Work (PoW) component, which requires the computation of complex scientific amazement. Due to the complexity involved, the PoW is very time-consuming and uses huge amounts of vitality comparable to the benefits generally obtained. In this, the approval of the exchange is also much more moderate than the electronic channels. Research shows that Blockchain 1.0 can handle up to seven exchanges at once, and thus has a significantly moderate throughput. Selfish mining, which is used by conspiring miners to make more revenue than their mining capabilities, is extremely vulnerable to Bitcoin. As a result, Bitcoin eventually becomes a centralized system controlled entirely by these self-interested miners. Up to 40% of the time, behavior-based clustering approaches can reveal the true identity of otherwise anonymous Bitcoin users. Another significant flaw in

Satoshi's Blockchain 1.0 concept is that it only uses 1-megabyte (MB) blocks of data for bitcoin transactions. The final and most significant flaw of Blockchain 1.0 is its inability to enable Smart Contracts and other application areas other than financial utilities (Panda, Jena, Swain, & Suresh, 2021)

2.1.3.2 Blockchain Version 2.0: Smart Contracts

As blockchain 2.0 is coded the unused application is said to be running on a modern set of conventions ("blockchain 2.0 convention"). A comparison with the conventions of the Web and its layer of stacks outlines the connection between blockchain 1.0 and blockchain 2.0. The previous can be seen as the TCP/IP transport layer while the last mentioned can be seen as HTTP, SMTP, and FTP. In this setting blockchain, 2.0 applications would be associated to browsers, social systems, and file-sharing administrations (Swan, 2015). Blockchain 2.0 terms serve to distinguish between Bitcoin and the blockchain as a programmable framework that's trusted and as an critical resource pinpointing it with increases of modern markable features of on-chain utility and extensibility. Rather than seeing the blockchain as portion of the decentralization of cash and installments, blockchain 2.0 grows the scope of the innovation to empower the decentralization of markets more by and large, and the exchange will include other sorts of resources by giving registers for certificates and rights and commitments in genuine domain, IPR, cars, works of art and so on (Gronbaek, 2016). The blockchain records this transaction as well. Ethereum makes use of Blockchain to construct smart contracts. It's the community-built technology that powers another cryptocurrency, Ether (ETH), which has a wide range of uses in fields like electronic voting, real estate, and trading. Instead of competing for bitcoins, Ethereum miners fight for Ether. In Ethereum, there is another sort of coin called gas that is used to reward miners for including transactions in their block. Every smart contract execution demands the sending of a certain amount of gas to entice miners to include it in the blockchain (Shi, 2021).

2.1.3.3 Blockchain Version 3.0 Dapps

Following Version 2.0, a new version was released that included DApps, or Decentralized Apps. A DApp is similar to a traditional app in that it can have a frontend written in any language that calls the backend, and the backend code runs on a decentralized peer-to-peer network. It takes advantage of decentralized storage and communication, such as Ethereum Swarm and other similar systems.

dApps are Blockchain-based apps or computer program that communicates with the Blockchain, which oversees and controls the state of all arrange performing artists. Blockchain-based apps, not at all like centralized apps that run on a single computer, run on a peer-to-peer network. Unlike centralized programs that run on centralized servers, such applications utilize decentralized capacity and communication, and the lion's share of their backend code runs on a decentralized network. ForkDelta, CryptoKitties, Bancor, Ether Shrimp Cultivate, PoWH 3D, Moon, Inc., and others are among the top-ranked dApps (Bhalla, 2021).

2.1.4 Types of Blockchain Used

Open blockchains, private blockchains, consortium blockchains, and crossover blockchains are the four fundamental shapes of blockchain systems. Each of these stages has its claim set of focal points, drawbacks, and perfect applications (Cao, et al., 2023). While the blockchain innovation that supports ventures is the same, the conclusion clients of the different shapes of blockchain may differ. End clients for open blockchains are the common open, while private blockchains are for invitation-only clients and their networks. Two basic blockchain qualities are the unchanging nature and distributed Ness. Since the record is unchanging, you'll continuously depend on it to be rectified. The blockchain's decentralized nature secures it against organized dangers.

2.1.4.1 Public Blockchain

Anybody who needs to ask or approve a exchange can get to open open blockchains decentralized systems of computers (check for exactness). Those who approve

exchanges (diggers) get compensated. Proof-of-work and proof-of-stake agreement methods are utilized in open blockchains (talked about afterward). The Bitcoin and Ethereum (ETH) blockchains are two well-known occasions of open blockchains. The open blockchain is the primary type of blockchain innovation. Usually where Bitcoin and other cryptocurrencies like it were born, and where they made a difference to advance disseminated record innovation (DLT). It broadly diminishes the impediments of centralization comparable to a need of straightforwardness and security. DLT disseminates information all through a arrange which is peer-to-peer instead of figuring it in a single location. Because of its decentralized nature, it requires a few strategy of information verification. That approach could be a agreement calculation that permits blockchain members to concur on the show state of the record. Two common agreement approaches are confirmation of work (PoW) and verification of stake (PoS). The open blockchain is unlicensed and unregulated. Anybody with an online association can enroll as an authorized hub on the blockchain stage. This client has get to to both current and authentic records, as well as the capacity to embrace mining operations. Usually a complicated equation that's utilized to analyze and include exchanges to your record. You can't alter the records or exchanges that are true blue on your arrange since the source code is as a rule open-source. Anybody can too see the exchange, spot botches, and make alterations (Paul, 2021).

2.1.4.2 Private Blockchain

A private blockchain isn't open. There are get to limitations. Those who wish to take part require the authorization of the framework chairman. They are as a rule overseen by one unit. NS. They are centralized. For example, Hyperledger may be a private, endorsed blockchain. A private blockchain could be a blockchain arrange that works as a closed arrange in a confined environment or is controlled by a single company. It capacities so also to a open blockchain arrange in terms of peer-to-peer network and decentralization, but it is altogether littler. Little systems inside a enterprise or organization, as well as those who take part and give computing control, are ordinary of private blockchains. Authorization blockchains and corporate blockchains are two terms for the same thing.

2.1.4.3 Hybrid Blockchain

The hybrid blockchain is best characterized as one that combines the most noteworthy highlights of both private and open blockchain arrangements. In an perfect situation, a cross breed blockchain would give both controlled get to and flexibility. The half breed blockchain engineering contrasts from other blockchain models in that it isn't open to everybody but still gives blockchain benefits such as keenness, straightforwardness, and security. Hybrid blockchain engineering, like all blockchain design, is totally customizable. Individuals of the crossover blockchain can select who can connect the blockchain and which exchanges are made open. Enterprises may seek the most excellent of both universes and utilize crossover blockchain, a sort of blockchain innovation that combines components of both private and open blockchain. This permits endeavors to set up private authentication-based frameworks in expansion to non-public confirmation frameworks to control who has get to to particular information put away on the blockchain and who has open get to to it. increment. Ordinarily, exchanges and records on the cross breed blockchain are not uncovered but can be confirmed on the off chance that wanted, for illustration by giving get to through smart contracts. Sensitive data is put away on the organize, but you'll be able still see it. Indeed on the off chance that the private substance can claim the crossover blockchain, it cannot alter the exchange.

2.1.4.4 Consortium Blockchain

Consortiums are a sort of blockchain arrange where the framework is kept up by bunches. Not at all like bitcoin, its blockchain isn't open to the open. A Consortium is most comparable to a private arrange. These blockchains can be thought of as a cross between open and private blockchains. Because it includes a decentralized structure in spite of being a permissioned organize. As a result, each organization in this arrange gets comparable treatment, ensuring that all parties locked in are treated decently. The arrange isn't ruled by a single body. It's a stage that permits various firms to collaborate and share information whereas too keeping track of rules and records. Consortiums are partitioned into three categories: technology-focused, business-focused, and dual-focused.

The fourth shape of blockchain, known as a unified blockchain, is comparable to a cross-over blockchain in that it combines private and open blockchain capabilities. Be that as it may, it contrasts in that it includes different organizational individuals working together on a decentralized organize. In brief consortium blockchain can be deciphered as a private blockchain with confinement in get to to a specific gather, evacuating the deterrent related with a private blockchain controlled by a single business. Agreement strategies are controlled by display hubs in a consortium blockchain. It contains a confirming hub that will be mindful for getting, Initializing, and approving all the exchanges. Exchanges can be gotten or started by part hubs.

2.1.5 Understanding Cryprographic Token To Create Proposed Sample Token

The term crypto token alludes to the title of a extraordinary crypto token or cryptocurrency. These tokens speak to elective, tradable resources or utilities that dwell on your blockchain. Crypto tokens are regularly utilized to raise bolster for swarm bargains; be that as it may, they can moreover fill in as a substitute for diverse things. These tokens are regularly made, appropriated, sold, and coursed through the standard beginning coin advertising (ICO) prepare, which incorporates a crowdfunding action to fund extend headway. Cryptocurrency tokens are a sort of cryptocurrency that speaks to an resource or a specific utilize and is on its blockchain. It can be utilized for theory purposes, to store regard, or to form buys. Cryptocurrency could be a computerized money utilized to encourage exchanges beside the blockchain (making and getting installments). crypto tokens and Altcoin are a sort of cryptocurrencies with different capacities. Cryptographic tokens made through the Starting Coin Advertising are frequently utilized to raise reserves for the deal of the swarm. There are four main types of cryptographic tokens mentioned below :

- Utility Tokens

  These are tokens that provide owners with access to blockchain-based products or services.

For example, you can use Ether to access Dapps or pay for running smart contracts on the Ethereum blockchain. Like the Gascoin provides access to the NEO network.

- Payment Tokens

  These are tokens that provide owners with access to blockchain-based products or services.

  For example, you can use Ether to access Dapps or pay for running smart contracts on the Ethereum blockchain. Like the Gascoin provides access to the NEO network. Payment tokens are coins. Their main purpose is to act as a medium of exchange, storage of value, and a unit of account. Important cryptocurrencies such as Bitcoin and Litecoin are payment tokens.

How the fiat currency gains or loses the value of payment tokens based on the law of supply and demand. Higher demand and lower supply add value, while lower demand and higher supply reduce value.

The twist is that the supply of some cryptocurrencies is restricted. For example, you can only mine 21 million Bitcoins. This means, at least in theory, that more and more people will start paying for goods and services in cryptocurrencies, and their value should rise sharply as the supply of new coins declines (Egiyi & Victor, 2021).

- Security Tokens

  Security tokens are conventional resources such as stocks and stocks that have been changed over to advanced tokens on the blockchain. Like conventional securities, security tokens donate proprietorship to the proprietor. For this reason, increasingly controllers control the way they issue and exchange. Most controllers utilize a adaptation of the Howey test to decide in the event that a token may be a security token. This can be a test created by the US Preeminent Court in a Securities and Trade Commission continuing. The token can be

considered a security token on the off chance that the holder has gotten the token in exchange for cash that has been contributed in a common undertaking. That they expect to form a benefit and they will not do any of the work that's required to create that benefit.

- Non- Fungible token (NFT)

  NFTs are tokens that can be utilized to speak to possession of a one of a kind thing. It can symbolize craftsmanship, collectibles, and indeed genuine domain. They can as it were have one official proprietor at a time and are ensured by the Ethereum blockchain-you cannot alter the verification of possession or copy/paste unused NFTs. NFT stands for non-fungible token. Non-fungible is an financial term merely may utilize to portray things like your furniture, a melody record, or your computer. These things are not conversely with other things since they have one of a kind properties. Fungible things, on the other hand, can be exchanged since their esteem characterizes them instead of their one of a kind properties. For illustration, ETH or dollars are fungible since 1 ETH / $1 USD is replaceable for another 1 ETH / $1 USD (Taherdoost, 2023).

Hash Function comes from the French word for “hacker”. It means “to shred” and shows how a hash function is designed to “hack” data. Hash tables, another type of data structure, are often used to quickly identify two identical hashes (hash values). After Diffie and Helman first identified the need for a one-way hash function in their groundbreaking paper on public key cryptography in 1976, the development of cryptography progressed rapidly over the next 20 years. In 1990, cryptographer and MIT professor Ronald Rivest invented the MD4 hash function, and later the MD5 and MD6 functions. In 1995, the NSA developed SHA1 (Secure Hash Algorithm 1), based on Rivest's design, and in 2001, it was updated to SHA2. SHA2 is the standard that influenced SHA256, which served as the basis for Bitcoin's consensus algorithm.

2.1.6 Basic Ideas and Real-World Use of Blockchain in Project Management

Blockchain technology has become an important tool in project management. It provides new ways to solve ongoing problems like being transparent, responsible, and keeping everyone involved updated in real time. Researchers like (Saberi, Kouhizadeh, & Sarkis, 2019) and (Kshetri, 2018) highlighted how decentralized ledgers and smart contracts can help make tracking projects, automating contracts, and managing resources better. In strategic project management, these features support the need for making good decisions quickly, lowering risks, and building trust among everyone involved. To test these ideas in real life, a special blockchain system and a sample cryptocurrency token were created for this research. This simulates a project using blockchain where transactions, progress, and rewards can be clearly tracked. The complete technical information and how to use it are shown in Appendix 2. It clearly demonstrates how blockchain can be used in project management to help with the ideas talked about in the literature.

2.2 Possible Future of Blockchain

The Blockchain token designed can be used as a reliable and transparent source to carry out any monitory transaction that can give real-world value in all the sectors that we use. Deciding the total supply of the Token, the Token can be for any day-to-day transaction as it can be developed as a decentralized structure inside any organization and for the transaction that will be created as we previously explained, the transaction could limit the movement of the information quickly and reliably. The use of the blockchain technology can help to control corrupted management as the token supply gets limited and can be transacted digitally with the unique digital signature that reduces the probability of hiding the hard cash or Black money in Industrial sectors. Also, the technology can be used for any other transaction between two parties without the involvement of centralized authority.

It can leave a record that is tamper-proof and cannot be altered in any other way. This has the potential to change the traditional organization with the dynamic power of

transparency and decentralized value. Using distributed ledger technology can replace the traditional method of paper-based activity or system. Blockchain might be adopted by the central banks with its one of the uses like we have designed cryptographic token and will be widely used among the public. The use of technology will widely reduce the cost of transaction and quickly complete the transaction than the normal traditional way of transaction with high banking costs. It also could be the best platform for trading with any goods. As a prediction, the Blockchain market could be the biggest and might reach 163 billion by 2026 and will continue to grow with upcoming technology like Metaverse where the NFT Tokens are being created within the blockchain.

2.3 Code Snippet Used To Create Token in Blockchain

```
pragma solidity ^0.8.2;

contract ISMA {
    mapping(address => uint) public balanceOfAccount;
    mapping(address => mapping(address => uint)) public allow-
ance;
    uint public totalSupply = 10000 * 10 ** 18;
    string public nameOfToken = "ISMA";
       string public symbolOfToken = "ITK";
    uint public decimalNumber = 18;


    event Transfer(address indexed from, address indexed to,
uint value);
    event Approval(address indexed owner, address indexed
spender, uint value);

    constructor() {
        balanceOfAccount[msg.sender] = totalSupply;
    }

    function balanceOfAddress(address owner) public re-
turns(uint) {
        return balanceOfAccount[owner];
    }


    function transfer(address to, uint value) public re-
turns(bool) {
        require(balanceOfAddress(msg.sender) >= value, 'low Bal-
ance');
       balanceOfAccount[to] += value;
        balanceOfAccount[msg.sender] -= value;
       emit Transfer(msg.sender, to, value);
```

```
        return true;
    }


    function transferFromAddress(address from, address to, uint
value) public returns(bool) {
          require(balanceOfAddress(from) >= value, 'low Bal-
   ance');
        require(allowance[from][msg.sender] >= value, 'allowance
low');
        balanceOfAccount[to] += value;
           balanceOfAccount[from] -= value;
        emit Transfer(from, to, value);
        return true;
    }


    function approve(address spender, uint value) public returns
(bool) {
        allowance[msg.sender][spender] = value;
           emit Approval(msg.sender, spender, value);
        return true;
    }

}
```

2.4 Risk Associated with Blockchain

1. **High Installation Costs**: One of the biggest problems with using blockchain in managing projects is that it can be very expensive to set up. Building blockchain systems needs a lot of money for special computers, software, and expert workers. Also, businesses have to pay for training their workers and connecting blockchain with their current project management tools. This can be expensive, especially for small and medium-sized companies (Konig, Unger, Kieseberg, & Tjoa, 2020).

2. **Flexibility Issues**: Public blockchains have a hard time growing because they process transactions slowly and use a lot of energy. As project data increases, the system might have trouble effectively managing a lot of transactions. This can cause delays in getting projects approved, receiving payments, and completing the work. The ability to grow is still an important issue, especially for big and fast-moving projects (Pintado, Dumas, Garcia-Banuelos, & Weber, 2020).

3. **Integration with Existing Systems**: Most companies already use well-known project management tools like Microsoft Project, Jira, or Primavera. Adding blockchain technology to these current systems is complicated and might need special solutions, which can take a lot of time and cost a lot of money. Also, many old systems aren't made to connect with decentralized networks, which causes problems with compatibility and keeping data in sync.

4. **Regulatory and Legal Compliances**: Blockchain works in a way that is not controlled by one central authority, which leads to worries about whether it follows current laws and regulations. Many countries still do not have clear rules about using blockchain, especially for things like enforcing contracts, protecting data, and taxes. The legal acceptance of smart contracts is different in each place, which makes it hard for businesses to use them for official agreements in project management. (Zafar, 2025)

5. **Smart Contract Limitations**: Smart contracts can make many project management tasks easier, but they aren't always flexible enough to deal with complicated agreements that need human decision-making. Smart contracts work according to set rules, and if there are mistakes or unexpected events after the contract is started, it's hard to change them. Also, mistakes in smart contracts can cause problems that can't be fixed because blockchain transactions can't be changed. This makes it hard to make sure smart contracts work properly in every situation.

2.5 Summary

Under this section, we went through all the concepts and the type detailing the Blockchain and its importance in the Modern and the Future enhancement of Blockchain technology. We knew the types of blockchain were private blockchains, consortium blockchains, crossover blockchains, and the open blockchain that provides a fundamental

shape for the blockchain system. Detailing the public blockchain it is an open decentralized network of computers that use POW and POS procedures. It is unregulated and unlicensed anyone can register as an authorized node of the Blockchain platform. Private blockchain in another hand is restrictive and operates only in a closed network, which is used within a closed circle or an organization where limited persons or participants can access it. Modern-day use of the private blockchain network is for voting, assets ownership, supply chain management, digital identity, and others.

Semi decentralized type of blockchain which is also known as the Consortium blockchain is contrary to private blockchain that is managed only by a single organization. More than one organization can act as a node in the consortium that can carry out mining or exchanges of the operation and are generally used by the government organization, banking system, and others. Hybrid is another type that is a combination of the private and public blockchain and uses the feature of both the private and public blockchain that can have permission which is a private-based system as well as a public-based system. Transaction in the Private network of a hybrid is generally verified within the same network but it also can get released in public blockchain to get verified. Public and private blockchains have been the most popular variants in the past, but more and more authorized blockchains that provide a midpoint between the two allow for limited activity by external providers and vendors. Ultimately, we want you to use your understanding and decide which blockchain will best serve your purposes. If you are part of a public blockchain network, all you need to do is gain a deep understanding of how the public blockchain works to take smart action in the future.

Concluding the section, Methodology Creating Blockchain and cryptographic Token using the Hash function, Blocks, and solidity we understand that for basic creation of any cryptographic token and publish it on blockchain we need to first understand the working of the Hash function. As we should use the hash function, we understood the importance of the hash function in Blockchain. To design a cryptographic token, we should use the Block and Blockchain method so under this chapter we can have a clear view of how the block operates within the blockchain and see that the block cannot be altered once its placed in the blockchain.

Further for designing a cryptographic token we must understand how Cryptographic tokens work or is implemented in the blockchain so we also have to understand how the cryptographic token perform and can be carried out for a transaction from one address to another using the secure method by generating private and public key for other end-user to continue the transaction or flow of the token within its designated supply. For the outcome of the proposed model of Cryptographic token, we are using the SOLIDITY high-level object-oriented language.

3 Methodology and Data

This chapter explains the practical approach used to study how useful people think blockchain technology is and the challenges they face in using it. Since the study aims to understand feelings, to understand how can blockchain technology make project management clearer and more effective, how can smart contracts help in project management and how can blockchain help in building trust and minimize the risk associated with the projects and find upcoming trends in different industries, a survey method was chosen. This approach helps gather consistent information from various groups of people. This methodology was designed to:

1. Measure opinions using Likert-scale questions.
2. Look into connections, like how knowledge about a topic relates to a positive outlook on blockchain.

Even though bigger samples are better, the 47 answers we collected give us a good starting point to spot early trends. We are using Excel for our data analysis because it's easy to use and works well for small to medium-sized data. The next sections explain how the research was planned, how data was collected, and how it was analyzed, as well as any limitations of the methods used.

3.1 Research Design

This study uses a structured online survey to collect numbers and data about how people see the current and future uses of blockchain technology. The survey includes three types of questions: 1) questions that ask about your profile including age, education and blockchain familiarity, 2) questions that ask how much you agree with statements about reasons for adopting or not adopting something and its benefits (on a scale of 1 to 5), 3) questions that ask about the challenges and future outlook of blockchain. The design matches the study's goal of finding connections between people's job backgrounds and their views on using blockchain.

3.2 Data Collection

We gathered information using a Google Forms survey shared with professionals in IT, finance, education, and similar areas through LinkedIn, university connections, and blockchain discussion groups. The survey got 47 complete answers in 4 weeks. To make sure it was clear and accurate, we tested the questionnaire with 5 colleagues before sharing it, improving any confusing wording. Even though convenience sampling was used (which is a limitation mentioned in Section 3. 6), the sample includes a wide variety of skill levels, from beginners to experienced blockchain users.

3.3 Variables

The study looked at two main types of variables to understand how people see the effects of blockchain and what obstacles it faces.

Independent (Predictor) Variables: Factors about people like age group (1=Under 25, 2=26–35, etc.), and how well they think they know about blockchain (1=Not familiar to 5=Expert). These factors were used to divide the responses and check for differences between groups (for example, to see if lower aged professionals think blockchain is more important than other groups do).

Dependent (Outcome) Variables: Answers on a scale of 1 to 5 measuring people's feelings about the benefits of blockchain (like "Blockchain makes things more secure"), difficulties in using it (like "Scalability makes it hard to use widely"), and its future possibilities (like "DeFi will change traditional finance").

This setup allowed us to compare different things (like how well people know something and the benefits they see) and find key themes. This matched the study's goal of spotting useful trends in using blockchain.

3.4 Data Analysis Methods

The survey data we gathered was looked at with Microsoft Excel to find important information and check key connections. First, we calculated simple statistics (like average, standard deviation, and how often each answer was given) for all the responses on the Likert scale. This helped us understand the general trends and differences in how

participants viewed blockchain technology. Next, we checked how reliable our survey questions were by calculating Cronbach's alpha. This helped us see if the questions that measured similar ideas (like perceived benefits) were consistent with each other, confirming that our survey was reliable for more analysis. To look at how different factors are related, we used Pearson correlation for continuous data (like how well someone knows something and how important they think it is). For data that is ranked or doesn't follow a normal pattern, we used Spearman's rank correlation. We looked at the open-ended responses by grouping similar ideas together, like "rules" and "user experience. " This helped us understand the answers better and added more information to the numbers we found. This method used both numbers and people's opinions to understand the data better.

3.5 Tools Used

- Google Forms: Making surveys and collecting the first set of data.
- Microsoft Excel: Fixing data, checking reliability and connections, and making visual charts (like bar charts and scatter plots).

3.6 Ethical Considerations

The study followed ethical rules to protect participants' privacy and keep the data safe. All answers from the survey were gathered without using names through Google Forms, and no personal information was kept. At the start of the survey, participants received a simple consent statement that explained the purpose of the research, that joining was completely voluntary, and that they could leave the study whenever they wanted. The data was kept safe in password-protected files, and only the research team could access it. The study had little risk for the people involved, but there were some limitations. These included that participants chose themselves to be in the study, and the number of people in the study was small (n=47). This might make it harder to apply the results to a larger group. These points follow normal research guidelines and make sure we meet the ethical rules set by the institution.

4 Results

4.1 Overview of the Survey Structure

The survey was made to understand how different people see, use, and deal with problems related to blockchain technology. A total of 47 people took part. The questions were set up on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree) and divided into three main topics:

Demographics: Age, Continent, Education, Blockchain Familiarity

Q1–Q6: Perception and Adoption of Blockchain Technology

Q7–Q11: Challenges and Future Outlook of Blockchain Technology

3 Open Ended Questions

The questions were referred as Q1, Q2, Q3,…, Q11 for better and easy understanding in Excel. The relevance of questions with its number is shown below:

Table 1 Explanation of Numbering and Questions

Q No.	Questions
Q1	Blockchain is essential for modern transactions?
Q2	Blockchain improves security and reduces fraud?
Q3	Smart contracts will revolutionize legal agreements?
Q4	Enterprises should invest more in blockchain-based solutions?
Q5	Blockchain adoption is hindered by regulatory uncertainty?
Q6	Decentralized finance (DeFi) will replace traditional banking in the future?
Q7	Scalability is a major challenge for blockchain adoption?
Q8	High energy consumption (e.g., PoW blockchains) is a concern?
Q9	Governments should establish clearer regulations for blockchain?
Q10	AI and blockchain integration will shape future technology?
Q11	Blockchain will significantly impact supply chain management?

4.1.1 Age Distribution

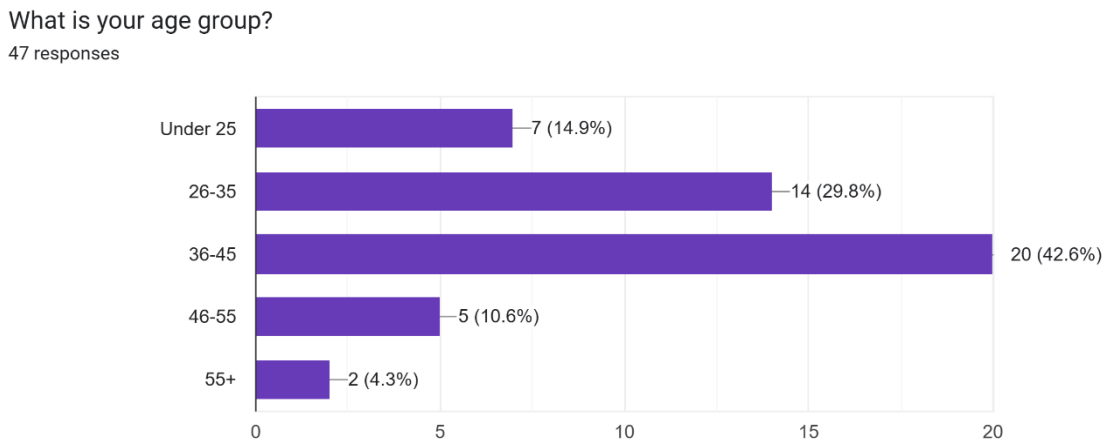


Figure 6 Distribution of respondents based on age category

The profile of the responders have been summarized as followed. As the Figure 29 describes already the age of participants are mostly from 36-45. We can also make a calculation from the image that most of the investors or the people thinking that blockchain and cryptocurrency are better options to revolutionize project management are from age 36-45. 42.6% of the participants are from age 36-45 responded the survey, whereas 29.8% of them were from 26-35 years of age. 14.9%, 10.6% and 4.3% of respondents were from under 25, 46-55, 55+ years of age respectively.

4.1.2 Geographical Distribution

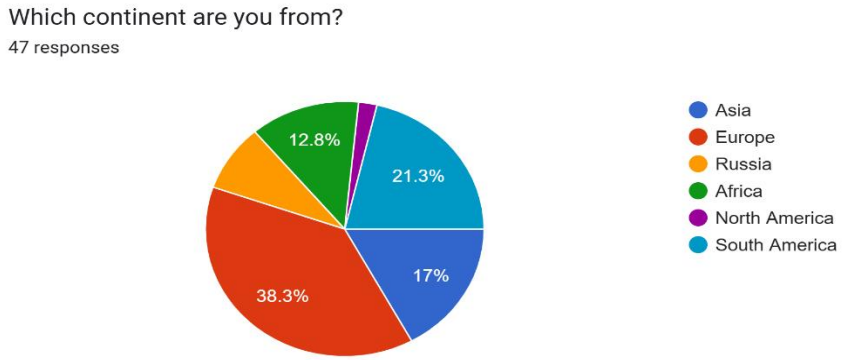


Figure 7 Distribution of respondents based on their continent

People came from different continents, with most of them coming from Europe. Here's a simple version of the text:

Here's a summary of how things are spread across different continents:

Table 2 Percentage of Respondents based on Continent

Continent	Percentage of Respondents
Asia	17%
Europe	38.3%
Russia	8.5%
Africa	12.8%
North America	2.1%
South America	21.3%

4.1.3 Education Level

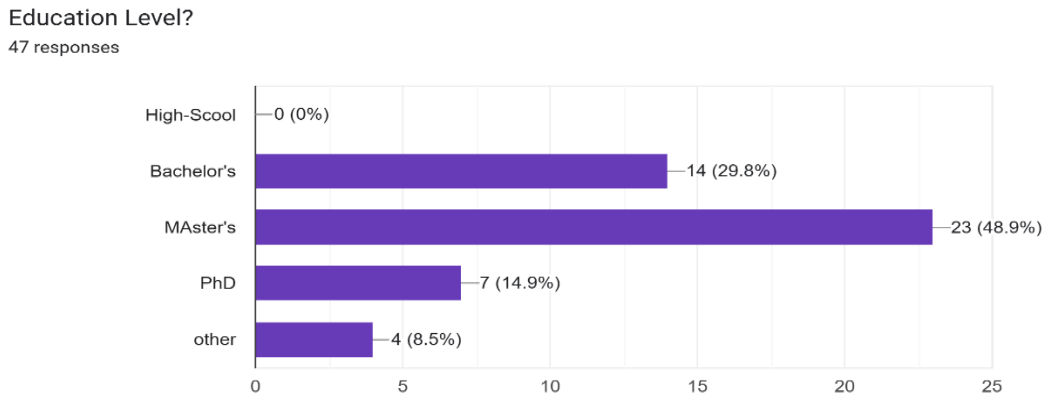


Figure 8 Distribution of respondents based on their education level

Respondents from different education background responded to the survey. The percentage of the education level of the respondents can be seen on the diagram above. There were maximum numbers of people who has professional knowledge about blockchain technology. Almost all the respondents had heard or practiced blockchain technology through their educational background.

4.1.4 Familiarity with Blockchain Technology

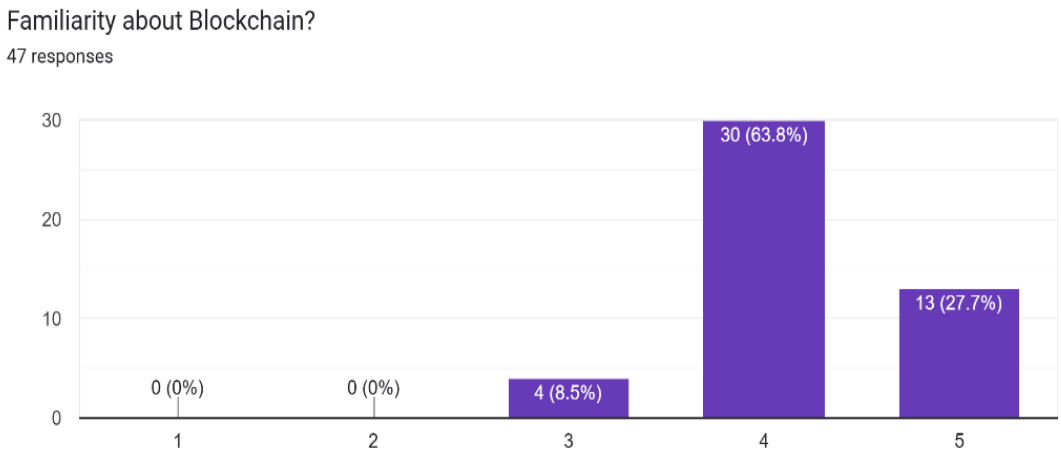


Figure 9 Distribution of respondents based on their familiarity with blockchain

Participants were asked to rate their familiarity with blockchain technology on a scale of 1 to 5 (1 = Not at all familiar, 5 = Extremely familiar). 27.7% of participants were extremely familiar while 63.8% were familiar. 0% of them were not familiar at all. This chart describes well that there is growing demand and knowledge base regarding blockchain technology. Later on, the familiarity scale was put on Ms Excel were the average familiarity score was **4.19**, with a median of **4**. This indicates that most respondents had a moderate to high understanding of blockchain. The detailed view of Mean and Median has been kept in page 77 for better understanding.

4.2 Perception and Adoption (Q1-Q6)

These questions measured and helped calculate the relevance and potential of blockchain in modern contexts.

Table 3 Mean and Median Score on each Survey Question (Q1-Q6)

Question	Mean Score	Median Score
Q1	4.57446809	4

Q2	4.744680851	5
Q3	4.5957447	5
Q4	4.553191	5
Q5	3.936170213	5
Q6	4.48936	5

Most people agreed that blockchain makes transactions safer and has good possibilities for businesses. However, people were more unsure about rules (Q5) and doubted that DeFi could take the place of banks (Q6).

4.3 Challenges and Future Outlook

These questions looked into the technical, environmental, and legal problems people think exist.

Table 4 Mean and Median Score on each Survey Question (Q7-Q11)

Questions	Mean Score	Median Score
Q7	2.680851064	2
Q8	2.723404255	2
Q9	4.723404255	5
Q10	4.595744681	5
Q11	2.80851064	2

Most participants thought that the ability to grow and the use of energy are important issues. People strongly agreed on the need for clear rules (Q9), which is the same point made in Q5. High scores on Q10 and Q11 show that people are hopeful about what blockchain can do in the future.

4.4 Reliability Analysis (Cronbach's Alpha)

To check how consistent the answers to questions Q1 to Q6 (about perception and adoption) are, we calculated Cronbach's Alpha. The outcome: Cronbach's Alpha for Q1-Q6 = 0.86642043 and Cronbach's Alpha for Q7-Q11 = 0.833394517. This value is higher than

the usual limit of 0. 70, which means that the questions are very reliable and effectively measure participants' overall feelings about using blockchain.

The high Cronbach's Alpha values in both categories show that the survey is trustworthy and the items are logically grouped together. The items probably measure what they are supposed to well, and the data is good for more math tests like looking at relationships, finding averages, and checking differences.

Variance and Cronbach's Alpha for Perception and Adoption of Blockchain (Q1-Q6)

Column1	*Variance*
Q1	*0.49977365*
Q2	*0.23268447*
Q3	*0.36849253*
Q4	*0.5875962*
Q5	*1.71933001*
Q6	*0.46265278*
Sum	*3.87052965*

Variance for Respondent average score (Q1-Q6)
0.276872391

Cronbach's Alpha
0.866420428

Variance and Cronbach's Alpha for Challenges and future outlook (Q7-Q11)

Column1	*Variance*
Q7	*1.408782254*
Q8	*1.376654064*
Q9	*1.395555556*
Q10	*1.383437229*
Q11	*1.383437229*
Sum	*6.947866333*

Variance for Respondent average score (Q7-Q11)

0.609108194

Cronbach's Alpha

0.833394517

4.5 Variance Analysis

The analysis of answers to questions Q1 to Q11 showed important information about what participants think about blockchain technology. Questions like Q2 ("Blockchain makes security better and lowers fraud") had similar answers from most people, showing that they mostly agree. On the other hand, questions like Q5 (uncertainty about regulations) and Q6 (whether DeFi will take over traditional banking) showed more varied answers, meaning people had different or strong opinions about them. Overall, the analysis shows that people generally agree on the main benefits of blockchain. However, they don't all agree on what will happen in the future or how ready the rules are. This points out the need for more understanding, education, and clear policies.

The difference and opinions in variance analysis can be viewed in table below:

Table 5 Difference and Opinions in variance analysis

Question	Mean	Variance	Interpretation
Q1	4.57	0.51	Moderate Agreement
Q2	4.74	0.23	Strong Agreement
Q3	4.59	0.37	Strong Agreement
Q4	4.55	0.60	Mixed Views
Q5	3.93	1.75	Divided options
Q6	4.48	0.4	Moderate Agreement
Q7	2.68	1.43	Mixed Views
Q8	2.72	1.98	Divided options
Q9	4.72	0.37	Strong Agreement
Q10	4.59	0.33	Strong Agreement

Q11	2.80	2.24	Strong Disagreement

The variance analysis for Q1–Q11 helps us understand how consistently participants view blockchain technology. Questions Q2, Q3, Q9, and Q10 received similar answers from most people, with low differences in responses (0. 23–037) and high average scores. This shows that many respondents strongly agreed on the advantages of blockchain, especially regarding security, automating legal processes, and its future technological effects. Questions Q1 and Q6 showed some agreement, while Q4 had more varied answers, indicating different opinions on business investment. On the other hand, Q5 (uncertainty about rules), Q7 (problems with growth), Q8 (energy use), and Q11 (using blockchain in supply chains) showed a lot of differences in answers (1. 43-224), showing that people have different or strong opinions about them. These results show that most respondents understand the main benefits of blockchain, but they don't all agree on the rules and the practical problems of using it.

Overall, the results show that people generally accept the promise of blockchain technology. However, there are some questions about its impact on the environment, its ability to grow, and whether current laws are sufficient. These areas are important chances for more learning, new technology, and making rules.

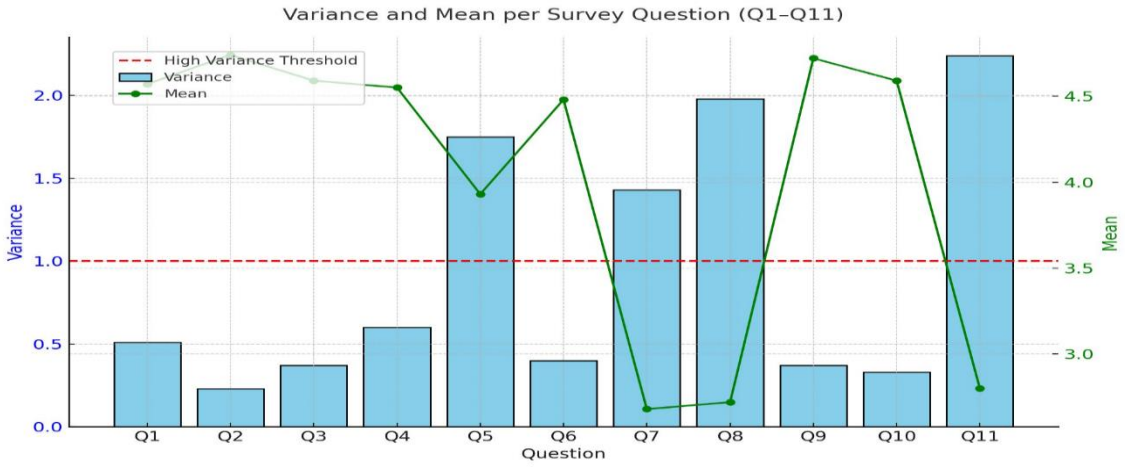


Figure 10 Variance and Mean per Survey question

4.6 Correlation Matrix

The correlation matrix shows how eleven survey questions about blockchain technology are related to each other. It shows important information: Strong Positive Connections: For example, Q11 has a strong connection with Question 7 (0. 872) and Question 8 (0. 900) This means that people who like some features of blockchain also tend to like other features. This shows that the people surveyed have a clear agreement. Weak Connections: The relationship between Q5 and Q2 (0. 075) shows that these questions look at different angles of blockchain, meaning they don't really affect each other much. Negative Correlations: For example, the negative correlation between Q7 and Q2 (-0. 068) means that if people feel more confident in blockchain, they might have fewer bad thoughts about its problems. In general, the matrix clearly shows how people think about blockchain and can help those involved to tackle worries, focus on strengths, and create specific education programs about blockchain technology. By knowing how these connections work, we can create plans to help the community learn and accept new ideas better.

Table 6 Correlation Matrix of each Survey Question

Column1	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	*Q6*	*Q7*	*Q8*	*Q9*	*Q10*	*Q11*
Q1	1										
Q2	0.6	1									
Q3	0.6	0.5195	1								
Q4	0.3	0.382	0.3434	1							
Q5	0.4	0.0752	0.2616	0.3315	1						
Q6	0.2	0.1214	0.2215	0.6234	0.5121	1					
Q7	0.1	-0.068	-0.061	0.1005	0.397	0.088	1				
Q8	0.1	-0.073	-0.082	0.0237	0.4092	0.098	0.8336	1			
Q9	0.3	0.4118	0.3885	0.4649	0.2712	0.224	-0.181	-0.291	1		
Q10	0.1	0.0115	0.4493	0.1221	0.2213	-0.038	0.0922	0.047	0.1068	1	
Q11	0.1	0.0209	0.0322	0.1868	0.3987	0.156	0.8722	0.901	-0.177	0.135	1

4.7 CONTRIBUTION OF FINDINGS:

This chapter explains the main findings of this study about using blockchain technology in project management. Blockchain is a new idea, so there hasn't been much research on how to use it in real life. So, this study uses different research methods to look into the possible good things and difficulties. The study also shows a practical example of a cryptocurrency token to explain how blockchain can be used in managing projects. The research shows the benefits and challenges of using blockchain in project management. We found several ways that blockchain can make things clearer, automate agreements with smart contracts, and improve money transactions in projects. The study shows that using a token system based on blockchain is possible.

In this system, 1 Euro equals 100,000 tokens, which can help make project transactions safe and easy. This study provides new understanding about using blockchain in managing projects. The results show that blockchain could change how projects work, but it is still just starting to be used. The study shows that people in the industry see blockchain as a promising new technology. However, they still have big worries about its ability to grow, unclear rules, and difficulties in combining it with existing systems. The study highlights that blockchain can help fix some problems in project management, but it’s not a perfect solution for every situation. It needs good planning to work well. This research helps people understand how to use cryptocurrency tokens in project management by showing a real example of one made for a specific project. It provides a basic starting point for future research that can improve how we use blockchain for money transactions, automating contracts, and working together with others on projects.

4.8 LIMITATIONS:

This research had a few limitations, such as the researcher's skills, difficulties in gathering data, and the lack of available past studies. One main problem is that the researcher doesn't have much experience in doing this kind of academic study. Also, while the researcher has learned about blockchain technology and how it is used in project

management, they still feel that their technical skills are limited. Another limitation is the small number of responses, which makes it hard to do a detailed statistical analysis. Also, there is a lot of research on blockchain technology and project management on their own, but not much has been done to look at how they work together. This makes it hard to expand on what has already been studied. The research used surveys and interviews, but getting answers from industry professionals was difficult because they were very busy and might not know much about using blockchain in project management. Even with these limitations, the study gives useful information about the research problem and adds to what we already know in this new area.

4.9 Summary

The study looked at how people feel about and the problems they face with blockchain technology. It used a survey aimed at professionals in IT, finance, education, and blockchain fields. Out of 47 complete answers, the data showed that people are quite familiar with blockchain, with an average score of 4. 19 out of 5. Most respondents agreed on the benefits of blockchain, especially in making things safer (average score of 4. 74), allowing smart contracts (4. 60), and promoting business investment (4. 55) Participants felt hopeful about the future, especially about combining blockchain with AI (4. 60) However, they had mixed opinions on issues like unclear regulations and whether DeFi could replace traditional banks. People were less worried about technical issues like scalability (2. 68) and energy use (2. 72), but they strongly agreed that there is an urgent need for clearer rules and regulations (4. 72) Answers to open-ended questions and analysis showed that people generally feel good about blockchain. However, there are still some problems to focus on, such as government rules, technical issues, and specific uses in different industries. The strong consistency of the survey questions (Cronbach's alpha greater than 0. 8) shows that the results are reliable, making this study a useful look at current professional views on using and developing blockchain technology.

5 Conclusion and Proposals

We can see the technology is getting upgraded almost every day and the blockchain is one of the new technologies that has entered the technological world, more specifically since the birth of Bitcoin. As blockchain, it has various usages and as the topic of this research, the author has shown one of the uses of blockchain technology as a cryptographic token. From the observation in chapter two, we saw how the block is created and continuing the block the Blockchain is built by linking the block with each other. Connection of each block gives a full form for the blockchain technology that is implemented with a unique hash that is digitally created. This is the main point to understand that the unique digital signature created makes the blockchain technology irreversible and provides users a private and public address for the transaction to be held. From the created digital signature, we saw how altering a single block could create an error for the blockchain to continue. The author has clearly shown how the Blockchain is unalterable and also presented the concept of public and private keys or addresses for further modeling the blockchain to create a cryptographic token using Solidity which is a high-level programming language.

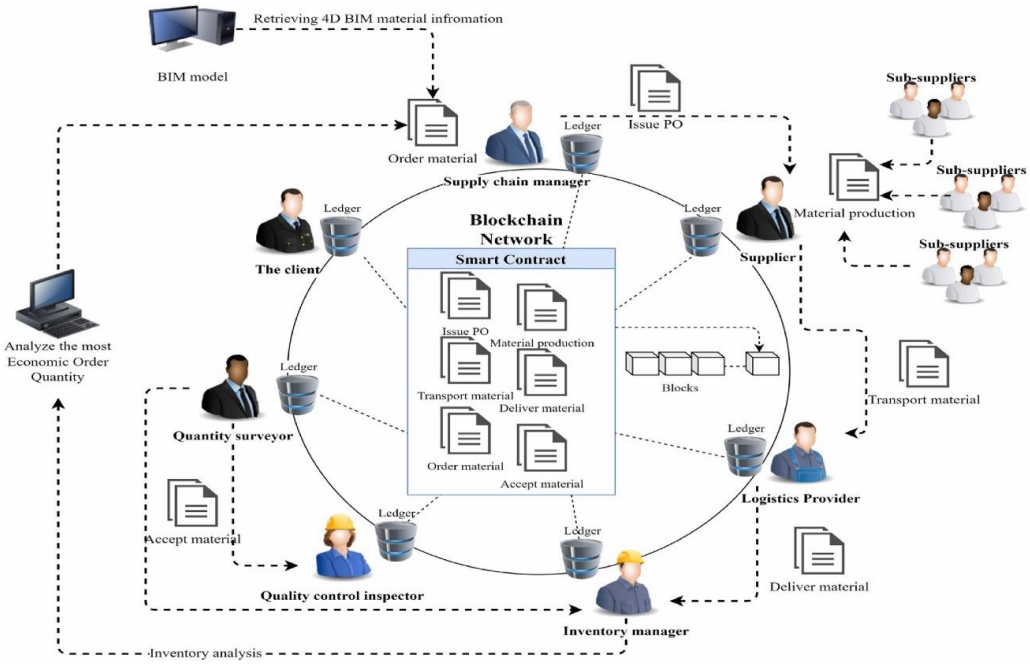


Figure 11 Blockchain network explaining its working mechanism on Business areas

The thesis describes how blockchain technology can make project management better by improving clarity, safety, and effectiveness. It highlights that successful projects depend on safe and clear agreements, which blockchain helps by keeping unchangeable digital records in shared databases. You can keep track of every job, deal, and payment, which means fewer middlemen and less chance of scams or misunderstandings. Blockchain can also help with keeping track of resources, connecting with people involved, and automating contracts. It gives everyone up-to-date information about the project, helps build trust among everyone involved, and uses smart contracts to automate payments and approvals. Also, blockchain keeps project information safe and secure because it prevents unauthorized changes and is not controlled by a single person or group. In general, it makes things easier, saves money, and provides a clear and dependable way to handle and check projects.

The author further on has shown the Use of Blockchain technology in modern days by creating cryptographic token using the method as in chapter two and using the high-level programming language solidity and coding it. So, a new Token ISMA was created using the blockchain concept and was linked with the test net for the configuration and checking if the token works accordingly to the blockchain. Metamask Ethereum based wallet was taken as the main wallet and was connected with the test net of the Binance smart chain and deployed to show one of the uses of Blockchain technology. Inside the research, we also can see that the transaction made in the blockchain from one public address to another included the gas fee which is a transaction fee for using the block in the blockchain that was successfully transferred.

The Model is purposed to be one of the use cases of Blockchain technology and by using this model different decentralized digital activities can be achieved like using the model as a digital currency and also could be used for the social matter, employee aspect or as an anti-corruption as the supply is limited and transaction moves within the blocks and cannot be altered. This designed use case of Blockchain as a token can also be useful in solving many other issues of blockchain and can also be adapted by universities as a local currency to digitalize the transaction of fiat currency and its private digital currency and

used for all the internal transaction which will help for the quick transaction and low fee transaction that is reliable for both student and university management.

A blockchain is made up of many pieces that connect digital records stored on different servers, making it almost impossible for anyone to access them without permission. It has several places where people working on the project can talk to each other. One important and praiseworthy project is Russia's VEB Bank, which is exploring how to use blockchain technology to improve their financial services. Blockchain will definitely change project management and make it work better and faster.

This thesis looked at how important and useful blockchain technology is now and in the future by demonstrating it in real-life situations and conducting research. This study showed how decentralized systems work by creating a basic blockchain and cryptocurrency token. A organized survey collected 47 answers from workers in different fields to understand what people currently think about blockchain. The analysis of the survey results showed that there is strong evidence that blockchain is very beneficial. It particularly improves security, transparency, and how well things operate. But unclear rules and technical growth are still big worries.

The study suggests that companies should think about using blockchain in their operations, particularly for managing supply chains, handling financial transactions, and using smart contracts. Using blockchain can help you stay ahead of the competition by building trust, cutting down on fraud, and speeding up important tasks. To get all these benefits, businesses should train their employees, work together with regulatory agencies, and look for partnerships with blockchain developers to ensure a smooth and safe implementation.

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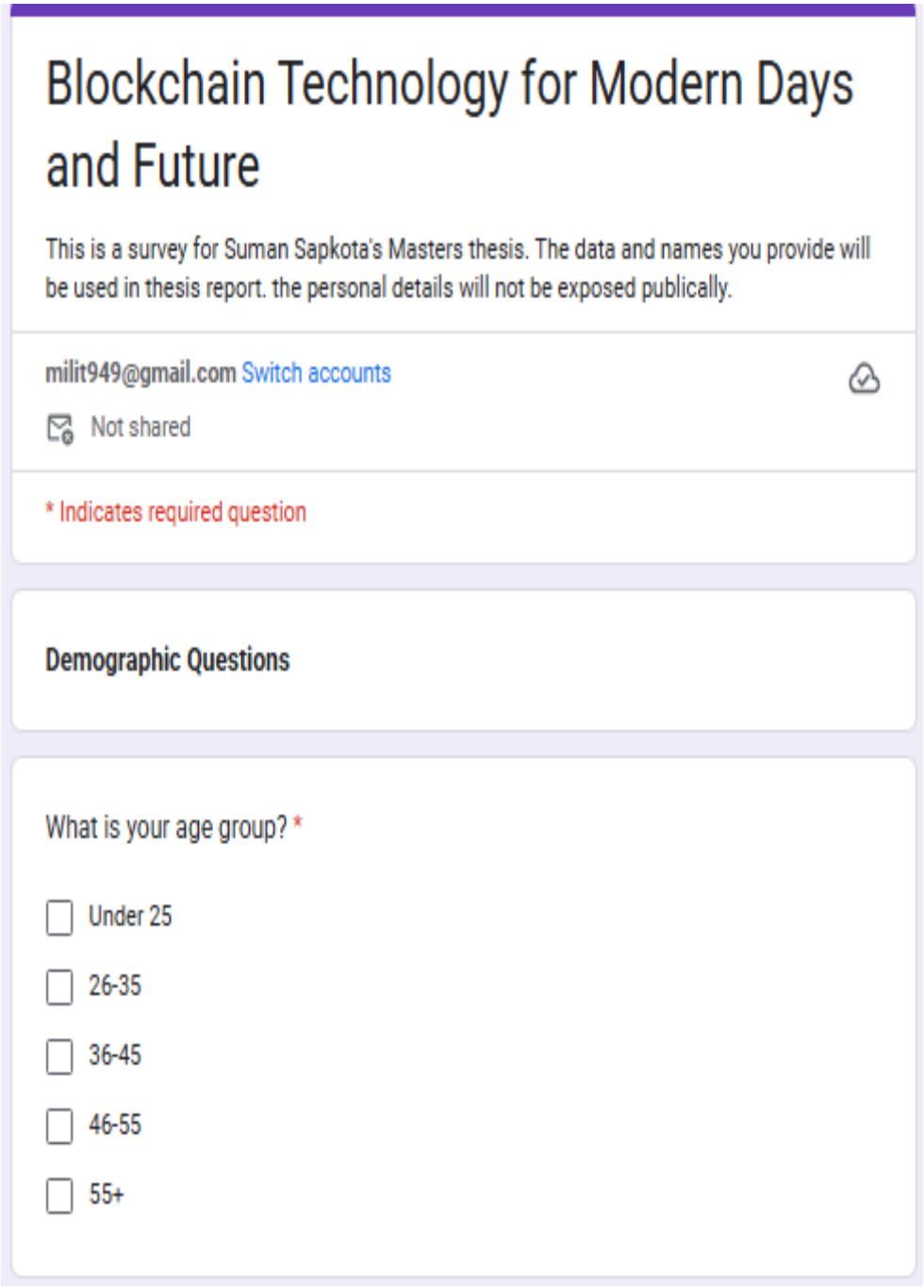
Appendices

Appendix 1. Survey

Link to the survey: https://docs.google.com/forms/d/e/1FAIpQLSd7OUbwpQuT-WEkYGZVFdu4RiilqtKy5Q57RH-LlhBu9T9D_aQ/viewform?usp=header



Blockchain Technology for Modern Days and Future

This is a survey for Suman Sapkota's Masters thesis. The data and names you provide will be used in thesis report. the personal details will not be exposed publically.

milit949@gmail.com Switch accounts

Not shared

* Indicates required question

Demographic Questions

What is your age group? *

- [ ] Under 25
- [ ] 26-35
- [ ] 36-45
- [ ] 46-55
- [ ] 55+

Which continent are you from? *

- [ ] Asia
- [ ] Europe
- [ ] Russia
- [ ] Africa
- [ ] North America
- [ ] South America

Education Level? *

- [ ] High School
- [ ] Bachelor's
- [ ] Master;s
- [ ] PhD
- [ ] Other

Familiarity about Blockchain? *

	1	2	3	4	5	
Not Familiar	○	○	○	○	○	Expert

Perception & Adoption of Blockchain

Blockchain is essential for modern transactions. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Blockchain improves security and reduces fraud. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Smart contracts will revolutionize legal agreements *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Enterprises should invest more in blockchain-based solutions. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Blockchain adoption is hindered by regulatory uncertainty. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Decentralized finance (DeFi) will replace traditional banking in the future. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Challenges and Future Outlook

Scalability is a major challenge for blockchain adoption. *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Answer	○	○	○	○	○

High energy consumption (e.g., PoW blockchains) is a concern. *

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Answer	○	○	○	○	○

Governments should establish clearer regulations for blockchain. *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Answer	○	○	○	○	○

AI and blockchain integration will shape future technology. *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Answer	○	○	○	○	○

Blockchain will significantly impact supply chain management. *

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Answer	○	○	○	○	○

Submit

Clear form

Appendix 2. Practical Part of the Creation of Blockchain and Cryptocurrency

Methodology Creating Blockchain and Cryptographic Token Using The Hash Function, Blocks and Solidity

A blockchain is a distributed ledger for all transactions in a peer-to-peer network. This technology allows participants to confirm transactions without the need for a central clearinghouse. Blockchain is a technology that enables the existence of (especially) cryptocurrencies. Cryptocurrencies are exchange media such as the US dollar, but they are digital and use cryptographic techniques to control the formation and transfer of currency units. Check the funds (Parizo, 2024). The cryptographic token can be considered as a digital unit of value that lives on the blockchain and has four different types like Utility tokens, Payment tokens, non – fungible tokens, and security tokens.

Hash Function in Blockchain Use

The term "hash function" comes from the French word "hacker". This means "chopping" and shows how the hash function is designed to "hack" the data. Hash tables, another sort of information structure, are frequently utilized to rapidly distinguish two indistinguishable hashes (hash values). After Diffie and Hellman to begin with recognized the require for a one-way hash work in a groundbreaking paper on public-key cryptography in 1976, cryptography advancement made quick advance over the another 20 a long time (Kamal & Ghani, 2021). In 1990, cryptographer and MIT teacher Ronald Rivest concocted the MD4 hash work, and afterward the MD5 and MD6 capacities. In 1995, the NSA (National Security Office) planned SHA1 (Secure Hash Calculation 1) based on Rivest's plan and upgraded SHA2 in 2001. SHA2 is the standard that impacted SHA256, which served as the premise for Bitcoin's agreement calculation.

- The purpose of hash functions:

On the one side, hash capacities were made to create substance uniform in length, and on the other, to be utilized as separately special identifiers. Outside of the bitcoin world, hash functions are commonly used for:

Creating a (short) checksum for an object, such as an ISBN checksum (International Standard Book Number). In cryptography applications, identifying any content almost without ambiguity but "briefly," without revealing anything about the content.

- Properties of Hash Function:

A cryptographic hash work ought to be computationally proficient, which implies that it ought to be able to create hash values quickly. It must be deterministic, within the sense that it must make the same result each time a particular input is given, and pre-image safe, within the sense that it must not deceive any data approximately the input within the yield.

At last, a hash work must be collision-resistant, which suggests it must be outlandish for two isolated inputs to surrender the same result. The three most significant qualities of hash capacities within the Bitcoin mining prepare are their deterministic include, pre-image resistance, and collision resistance (Lee & Kim, 2023).

- Hash Function in Mining process:

A piece is stuffed and contains various exchanges as well as data on the going before square when it goes through the Bitcoin network's approval method once more. In the event that somebody needed to adjust the record or double-spend a exchange, they'd need to upgrade the hash in each going before piece.

Miners must recognize a hash that fulfills the target trouble for the packaged block to be included to the blockchain. Each piece encompasses a piece header containing the piece number, the past block's hash, and a "nonce" with a timestamp. A nonce's reason is to extend the capriciousness of a cryptographic hash work by changing the input.

- Solving the Hash Function:

Whereas understanding the information is "hashed" by the hub, which changes over it into a hash esteem or "hash," which must continuously contain a specific number of zeros. The hub decides whether a hash meets the trouble criteria. The hash must start with the suitable number of zeroes. In the event that the hash meets the trouble criteria, it is broadcast to the rest of the network's diggers. The primary mineworker to discover a substantial hash changes over the square into a unused square and is paid in Bitcoin for the square compensate and expenses. In the event that the hash falls flat to

coordinate the organize trouble criteria, a modern nonce is chosen and hashed. Miners will most likely ought to develop a huge number of hashes with a expansive number of nonces before they discover one that meets the trouble (Werbach, 2018). Bitcoin mining could be a time-consuming and energy-intensive operation that requires a part of computing control. The Confirmation of Work prepare depends intensely on hash capacities. The blockchain would not be tamper-proof and inalterable without affirmation and generation of hash exchanges, and it would be outlandish to confirm who had how much Bitcoin at what minute.

Setting Blockchain through Blocks

Now moving into the Working of blockchain I used a website andersbrownworth.com to study detail about the working of blockchain starting from the Hash. So, considering the Hash is a digital fingerprint I input the prototype token name in the SHA256 HASH section. This randomly creates a unique hash for the token Name. Let's give the prototype token name "Lats Token ". Generating the hash for the Lats token we get Hash:

9f9bd09c06c30bd925c4905be3f95a73a1ee87f7d86f4e495679db6ce8e96cc

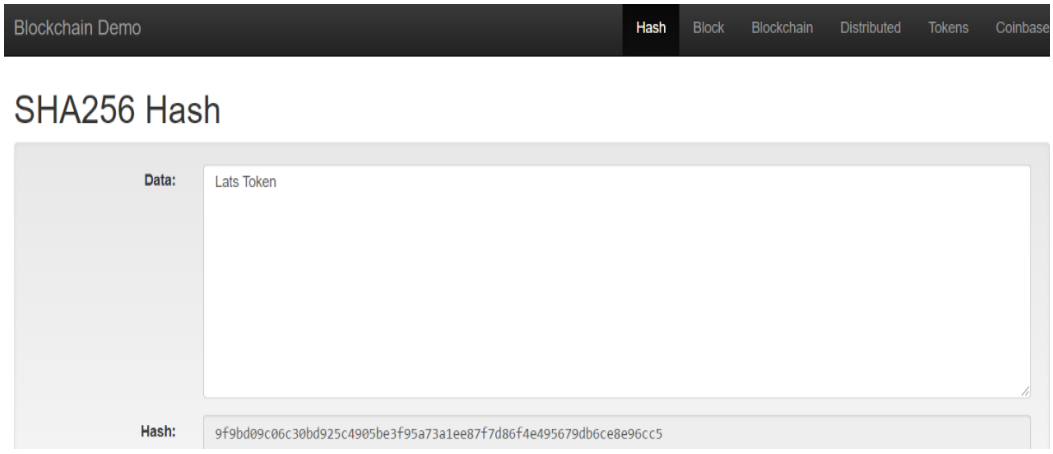


Figure 12 SHA256 HASH FOR TOKEN

As we can see the hash is generated as a unique fingerprint for the Token name. when we write any character within the field. it creates every time new hash for all the characters we input. This is the basic step toward blockchain technology. We will get the same hash no matter how many times we enter the same character regardless of the

amount of entry. So, this already creates uniqueness in the upbuilding of technology in the modern days.

Moving on to the next step Block which is exactly like hash but in this section, we can see some sections like Block number, which is just an assigned number for a block, and Nonce which is yet another assignment and we see the Section Called Data which is way similar to the task we worked before but this time under the hash section we will see it starts with four zero. Now to see in the figure below the originally the Block with Nonce with hash 0000f727854b50bb95c054b39c1fe5c92e5ebcfa4bcb5dc279f56aa96a365e5a is turned on green because it is assigned to the particular Nonce. But once we try to make some input in the data section the Block turns out to be red which indicates it doesn't match the unique digital fingerprint at particular Nonce.

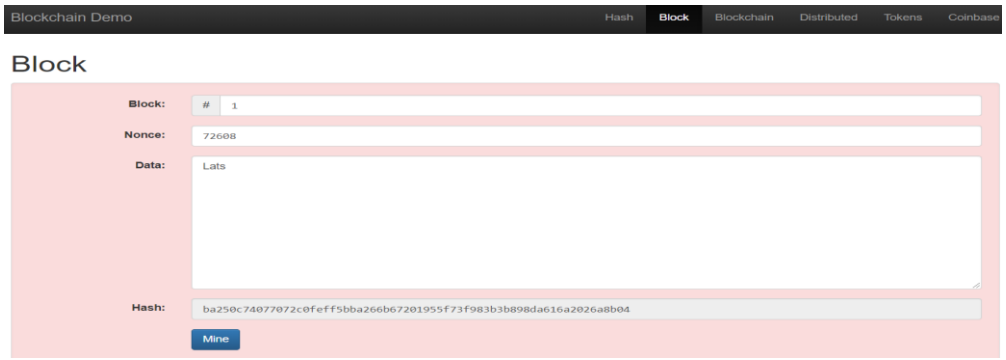


Figure 13 BLOCK BEFORE MINING

So we can see that the block with Noce 72608 is not valid or signed and that's where Nonce comes in as it tries to find the value that fits in into the particular Nonce. As so now if we would like to assign the Nonce to out the token, we can simply mine the position for our Input data. Once the "Lats "is input in the data field and mined it generated a Hash for the entered data and a Nonce is generated for the token. We can see in the Figure That the Assigned Nonce is 83107 and the hash is:
000064dc86e341f7500d870ff6932d65b2cb6ead985a315e44a5356bafbb26e9.

So, the Entry Lats has its unique spot in the Block under Nonce 83107 and if we try different entries in that Nonce it gives a red warning until it finds the right Input.

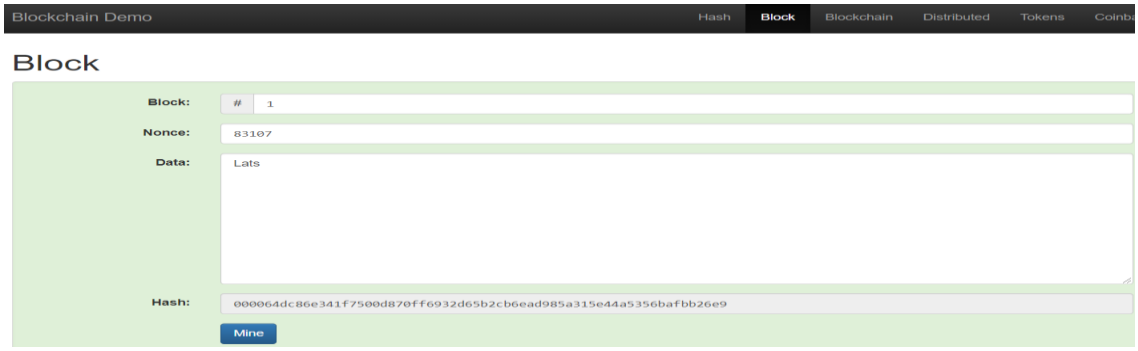


Figure 14 ASSIGNING NONCE WITH HASH MINING

Stepping one step more taking the base of Block now we see in the section of Blockchain Different Block with different Block Number (1,2, 3...), Nonce as in the block. the only extra section we see here is that we can use the Previous hash along with the hash. we can see in the figure Below the different blocks are assigned with the different Nonce but if we look closely into the section starting from Block 2, we can see the Hash of Block 1 into the section Prev of Block 2 and so on with the Hash of Block 2 in the Prev section of Block 3 it trails the previous block.

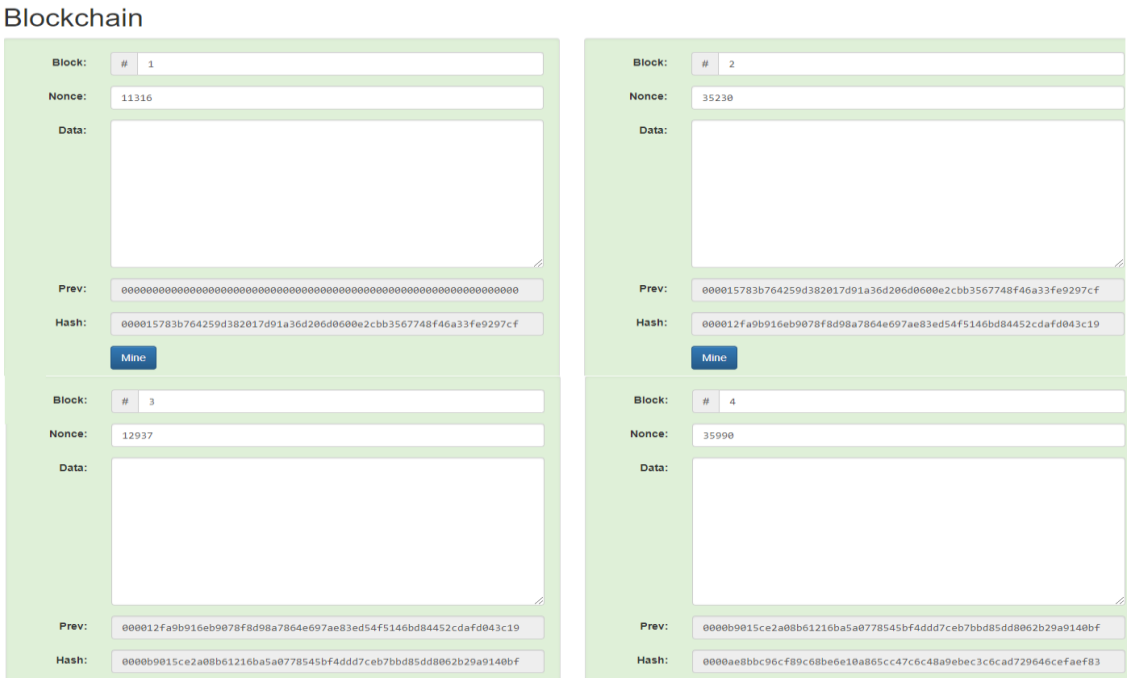


Figure 15 BLOCKCHAIN CONNECTION

If we input the data in one of the middle blocks or any it directly invalidated the data and shows the red color because the block is interrelated. We can go far in the block and change something that breaks the block and it will break all the blocks since then but everything before the breaking block remains still green. Now if we go to the fourth Block with Nonce 35900 and input Data as Lats and mine it we get New Nonce 75542 and Hash as 000009c4c429971fa0ec9a859772d57b54a937d5df361b1ea44e060ac27ee6a4

which maintain the link and keep the previous Block unaltered but the Fifth Block gets broken as the Previous Hash doesn't match with the new generated "Lats "Hash

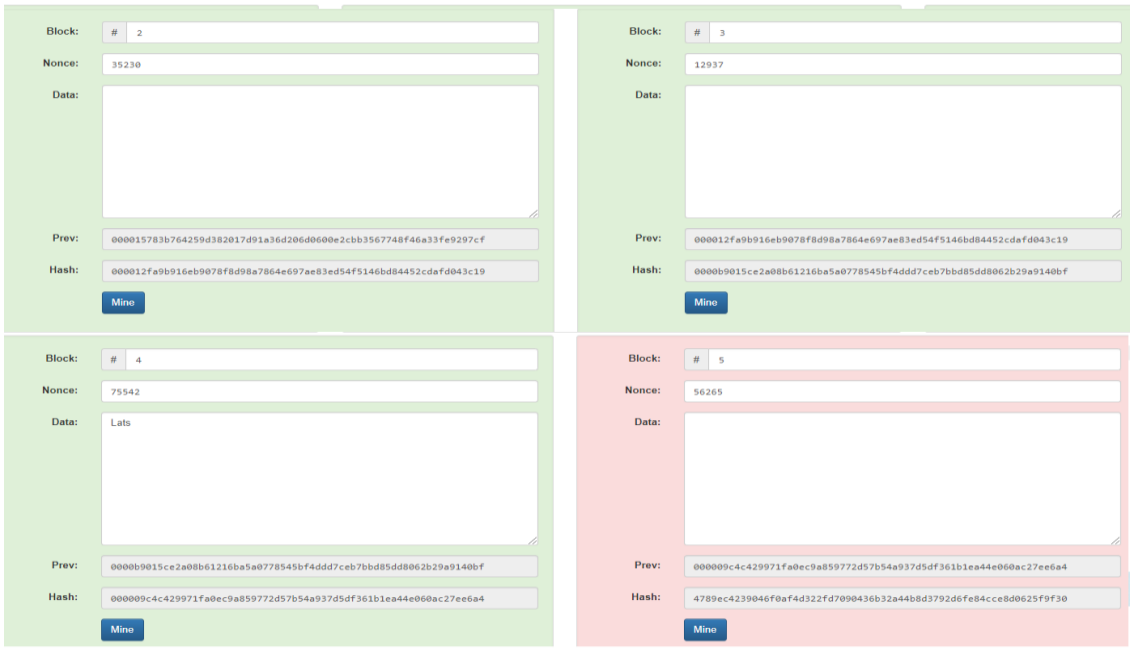


Figure 16 BLOCKCHAIN MODIFICATION

Once we altered Block 4 and mine it the new Hash was created which keeps the previous block unaltered but the fifth Block gets altered. So, in order to maintain link, we can now mine the fifth block which now automatically links with the fourth block with new Nonce number 24105, hash

00009a1585138bf9e8a311e9470af9ed6e5a1cea33271508d98040e195d33a04

and the Chain gets green signal. The more blocks that go by in the past that are harder and harder it gets to make changes.

How the blockchain is going to resist mutation resist change. Once we make the change in the block and remain it we can see the whole distributed structure, for that let's move on to the other section Distributed Blockchain which gives us an idea about how the blocks have been reminded. We can see in the picture that looks similar to the previous blockchain tab but here we see different Peer like Peer A, Peer B and it can go way more on the internet as a copy of the blockchain, so in this case, if we see initially the Block 5 in Peer B it has Nonce 56265 and hash
0000e4b9052fd8aae92a8afda42e2ea0f17972ea67cead67352e74dd6f7d217c
.once we modify the data at block 4 it turns red but remaining it gives us the new Nonce in block 4 and 5 with new hash at block 5 as 271508d98040e195d33a04 with Nonce 24105. But when we see other copies at Peer A and Peer C we see the Block hash is still 0000e4b9052fd8aae92a8afda42e2ea0f17972ea67cead67352e74dd6f7d217c so in this case the hash at Peer A and C block 5 wins and that's how completely distributed copy having a copy on many different computers they can all very quickly see if all of the blocks are identical.

Just to remember the blockchain can have 500,000 or more blocks very easily so rather of checking all of them all we have to do is look at the Hash of the most recent one so we can see if anything in a past way back was altered that can be told by looking at the block in the chain. So that the blockchain, that's the entire thing that has revolutionized modern-day technology.

Now, moving on to how blockchains work, I used https://www.andersbrownworth.com to explore the details of how blockchains work, starting with the Hash. So, since the Hash is a digital fingerprint, I'll type the prototype token name in the SHA256 HASH section. This will randomly generate a unique hash for the token name. Let's name the prototype token "Lats Token". When we generate a hash for the Lats token, we get the hash: 9f9bd09c06c30bd925c4905be3f95a73a1ee87f7d86f4e495679db6ce8e96cc5.

The blockchain will be resistant to mutation resistance changes. When we make changes to a block and stick to it, we can see the entire distributed structure, so let's move on to another Distributed Blockchain section, which gives us an idea of how blocks are re-stored. As you can see from the image, it looks similar to the previous blockchain tab,

but here we see different peers such as Peer A, Peer B, and it can be much more accessible on the internet as a copy of the blockchain, so in this case if we initially see block 5 Peer B, it has a nonce of 56265 and a hash of
0000e4b9052fd8aae92a8afda42e2ea0f17972ea67cead67352e74dd6f7d217c .
When we remove the link, we modify data 4, it becomes a red block, but it still gives us a new nonce value in column 4 and hash 5 271508d98040e195d33a04 and nonce 24105
But when we see the other copies in peer A and peer C, we see that the Block hash is still
0000e4b9052fd8aae92a8afda42e2ea0f17972ea42e2ea0f17972ea42e2ea0f17972ea42
e2ea0f17972ea42e27f67f67f17272d in this case computer A and C have completely different copies and blocks of C. everyone can see very quickly if all the blocks are identical. To remember, there can be 500,000 or more blocks in a blockchain, so to check them all, we only need to look at the hash value of the most recent block, so we can see if anything has changed in the past, you can tell by looking at the chain in the block. Because blockchain, it is the whole thing that has revolutionized today's technology. In this chapter, Blockchain and Cryptocurrency Creation Methods with Hash Function, Blocks and Solidity, we will understand that in order to create and publish the basis of any cryptographic token. in the blockchain, we first need to understand the working of Hash Hash function. Since we should use hash function, we understood the importance of hash function in Blockchain. To develop a cryptographic token, we should use Block and Blockchain method, so according to this chapter, we can clearly see how a block works in a blockchain and that a block cannot be changed once it is placed in the blockchain.
Furthermore, in order to develop a cryptographic token, we need to understand how cryptographic tokens work or are implemented on a blockchain, so we also need to understand how a cryptographic token works and how it can be transferred from one address to another in a secure manner, generate a private and public key for another end user to continue the transaction or authorization flow in its specified offering. We use the high-level object language SOLIDITY to generate the proposed cryptographic token model.

Cryptographic Token Working In Blockchain After Prototyping

Crypto tokens are advanced cash tokens. Advanced shapes of cash or virtual financial measures are named into these tokens, which live all alone blockchains. Blockchains are uncommon information sets that store information in pieces that are at that point bound or associated. This implies that crypto tokens, too known as crypto-assets, speak to a specific unit of esteem. Cryptography alludes to different cryptographic calculations and cryptographic strategies that secure these sections, counting B. Elliptic bend, open / private key match, and encryption employing a hash work. Cryptocurrency, on the other hand, may be a framework that empowers secure online installments made with virtual tokens. These tokens are spoken to by record sections interior the framework. These crypto assets routinely fill in as the trade units on the blockchains that are made utilizing the standard formats like that of the Ethereum arrange, which licenses a client to create tokens. Such blockchains work on the thought of keen contracts or decentralized applications, wherein the programmable, self-executing code is utilized to prepare and bargain with the different exchanges that happen on the blockchain. Too, for a note that A shrewd contract may be a self-executing contract in which the terms and conditions between the buyer and vender are composed straightforwardly on the line of code. The code and the contracts it contain dwell on a decentralized blockchain organize. The code controls execution and transactions are traceable and irreversible.

Crypto coins are sorts of foreign money which will be utilized to form buys; be that as it may, you may utilize a crypto token for bounty of distinctive thought processes as well, at the side investments and keep esteem. Tokens are made through a sort of beginning open advertising, which is how a company offers a rate of possession to the open, which is the way a company is begun. Tokens are made by cryptocurrency companies that need to raise cash. Speculators curious about the company can purchase these tokens. Financial specialists can utilize a variety of tokens for a assortment of reasons. They can hold onto them to speak to a parcel of the company or to exchange or make buys of merchandise and administrations. As a commonsense case, decentralized capacity supplier Bluzelle permits financial specialists to stake their local tokens and win exchange expenses and rewards. For illustration, you'll have a crypto token that speaks to a certain number

of client devotion focuses on a blockchain that's utilized to oversee such subtle elements for a retail chain. There can be another crypto token that gives privilege to the token holder to see 10 hours of spilling substance on a video-sharing blockchain. Another crypto token may indeed speak to other cryptocurrencies, such as a crypto token being break even with to 15 bitcoins on a specific blockchain. Such crypto tokens are tradable and transferrable among the different members of the blockchain (Yuxuan, 2024).

Cryptographic Token Transaction Scenario

Taking a scenario stepping up after the Distributed Blockchain from chapter 4 above and moving on to the Token tab we had a token just totally arbitrarily calling this token “Lats token “whose value is 1 Lats = 1 USD. Under the Peer A Block 1 we can see that the Coinbase balance for Andres is $100. This confirms the total amount in a digital wallet. As nobody had made any transaction or money movement previously to this, we see nothing in a transaction. Moving on to Block 2 we can see under Nonce 215458 there are some transactions like $ 10, $20, $15, $15 from Andres to Sophia, Lucas, Emily, and Madison Respectively.

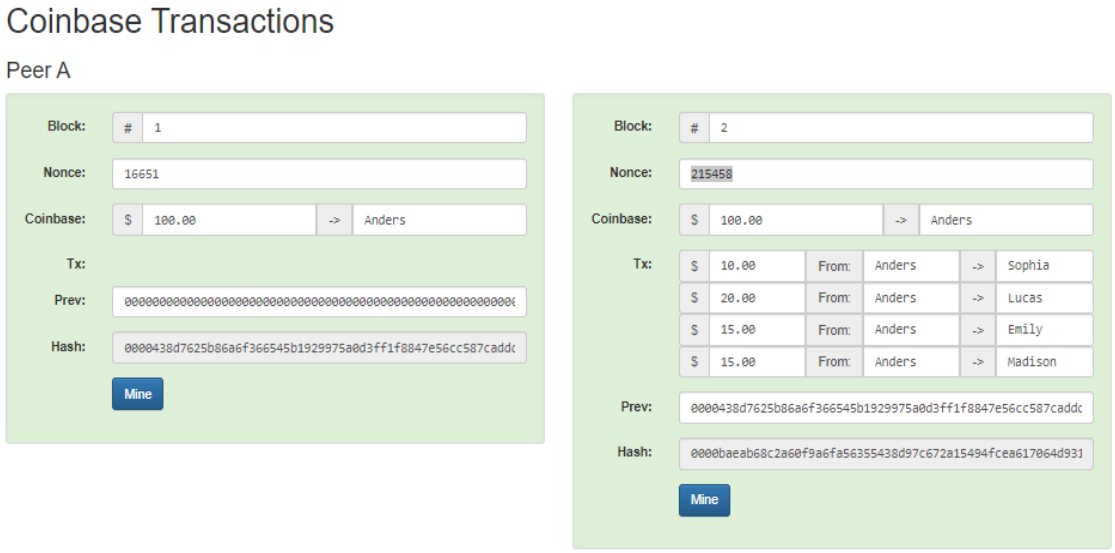


Figure 17 TRANSACTION BLOCKCHAIN 2

So, checking back in Block 1 if Andres has $100 to complete the transaction, yes he has it. When you add all the transactions done in Block 2, it all adds up but don’t go over

$100 so it follows some sort of basic transaction rule of currency that you can't invent out of thin air, rather it should be in your account balance to do the transaction. Its dispersion is controlled by the chain so now if we see another Block that is created and Zip forward in time and under block 5 Nonce 108899 we can see Jackson is giving Alexand $2.

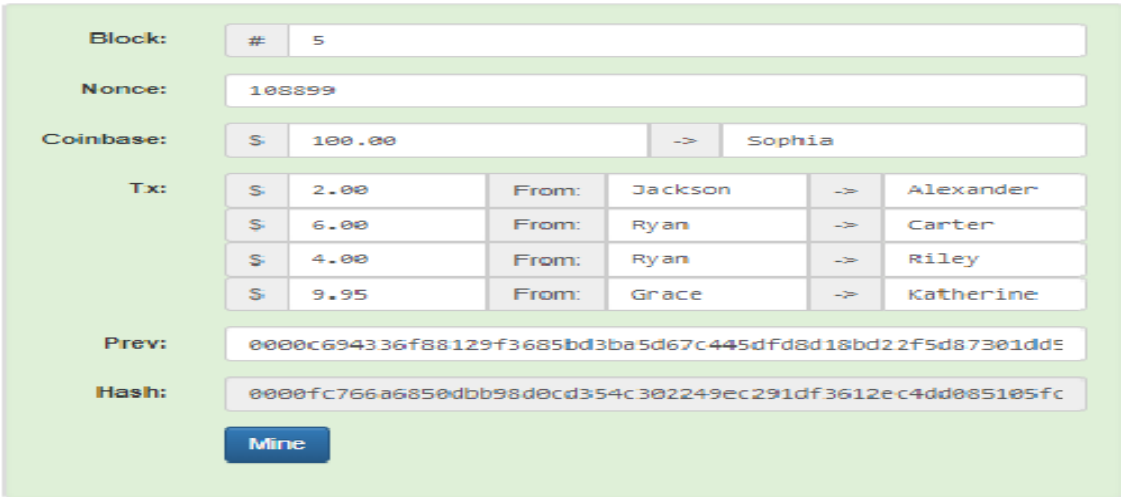


Figure 18 TRANSACTION BLOCKCHAIN 5

So now to see if Jackson has $2 to give for Alexander we have to move back to the previous block to check the scenario. As in this figure we can see that Emily had transferred Jackson $10 under Block 4, we know that Jackson had enough balance to create the transaction. It's one of the benefits of having a previous section under each Block. As we can see that the Previous section under Block 5 has the same hash 0000c694336f88129f3685bd3ba5d67c445dfd8d18bd22f5d87301dd560eb30e as in the Hash section of Block 4 it points back in the time and allows us to trace the provenance of any coin that we want.

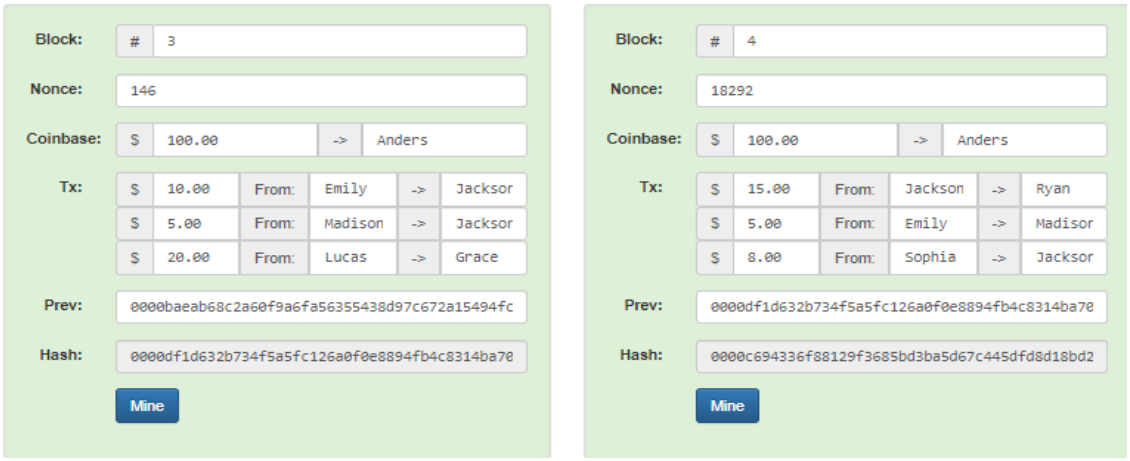


Figure 19 TRANSACTION BLOCKCHAIN 4

so that's the basic Blockchain and we are running currencies on top of it and as we know that the blockchains are their many copies everybody has a copy of it so if we mutate any of the previous blocks as shown in the Picture it displays the red color and doesn't match with other copies of the Block.

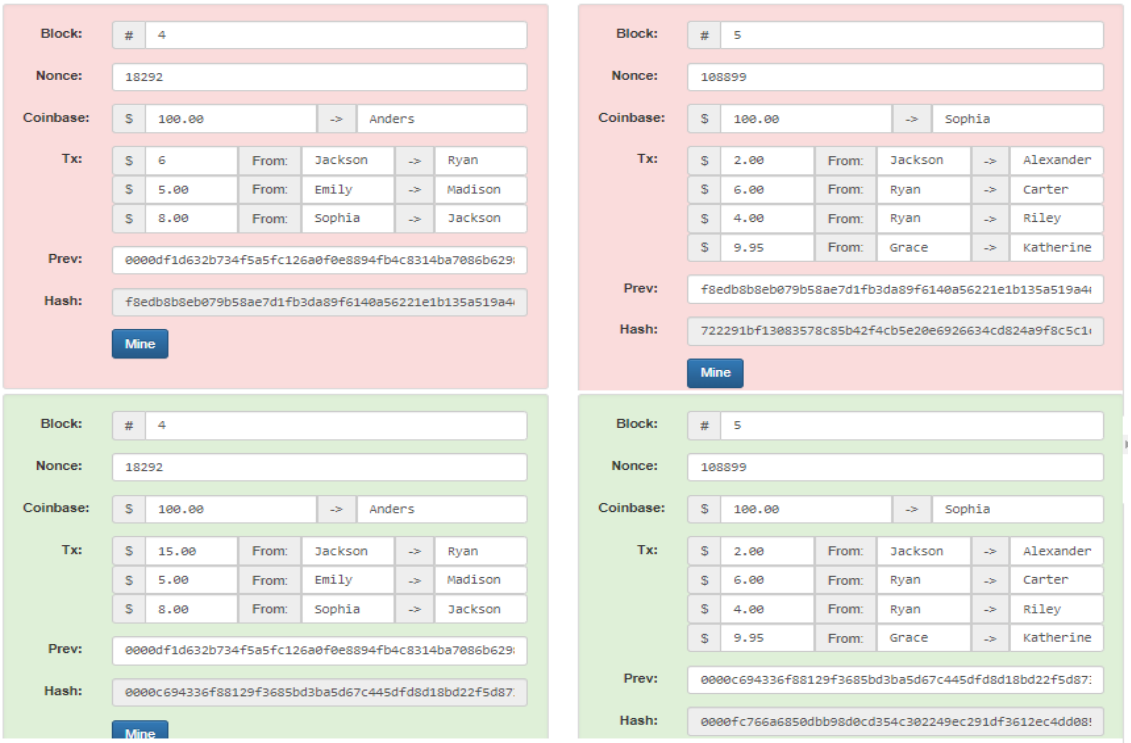


Figure 20 MODIFICATION OF BLOCK 4 PEER TO PEER

As We tried to modify the Transaction under Block 4 Peer A, transaction $6 from Jackson to Ryan Block 4 and Block 5 turned Red which doesn't match with other copies of the Block under Peer B and others. So, this resist tempering which is what we want for the currency and it works very well for things that are small and transactional like this and is an efficient way to handle the agreement on what has happened in the past. Which is a kind of immutable history that has gone on time of basic blockchain and a token.

We had created the Model of basic transactions that was moving money from one person to another but there's a big problem in modern days to know that what's stopping somebody from just adding a transaction that spends all of someone else money to them. Here in modern days protection here for the blockchain we are going to add security so that just not anybody can create a transaction and add. To do that we need to look at another cryptographic primitive, that is public/ Private key pair and then we will use that for the signature. Moving under the Private key section we can generate any private key and that generates a unique public key every time the Private key changes so for now we just take a random Private key:

107444903718300882763952135733595576026244567962852977942634828281700223011058

which gives out the Public Key:

042ac26b7478680324b15947678bbfc3bb1ac7cc9006f3596d90a4add35590c716454a3ab05eef4fc8009e0fcb110cefc3b47a2728ed3ef79e0ef3b657dfbc4723.

So just as the name implies that the Private key, we get only stays with us and can't be given to any other or shared but the public key that is generated concerning the Private key could be given out in public. Now using the Private key that we have generated can be used for doing the signature.

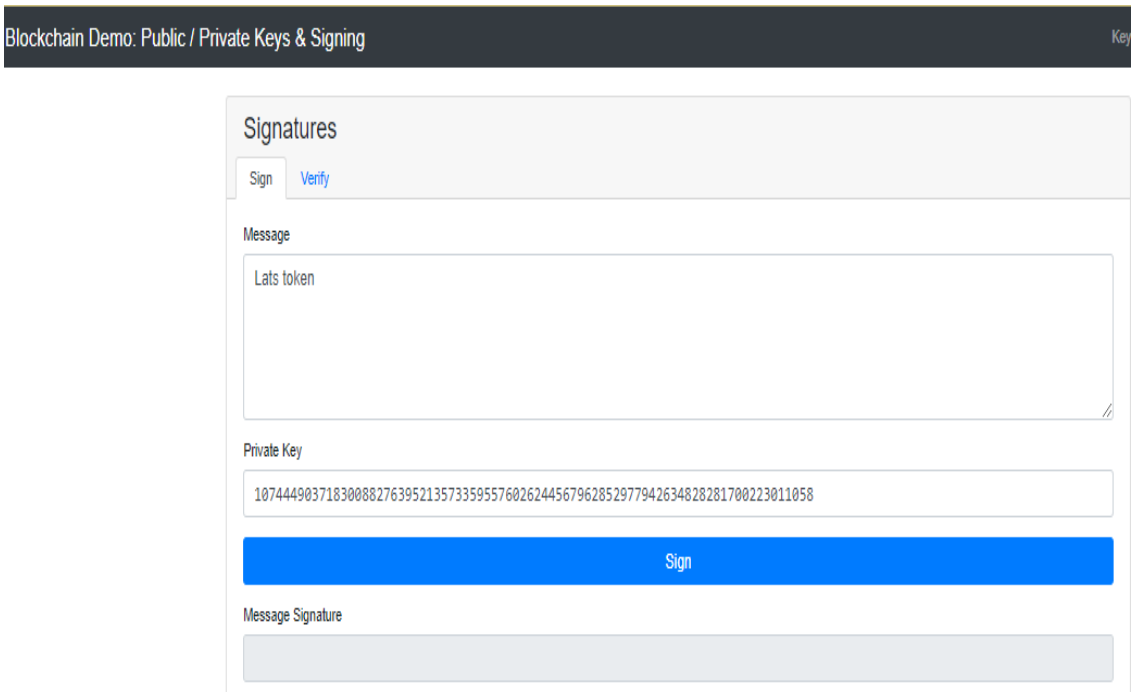


Figure 21 CRYPTOGRAPHIC SIGNATURE

So, let's move under the section signature and write out Private message "Lats token" along with our previously generated Private key and hit the Sign Button to come up with a message signature. Once the sign button is clicked, we got the message signature as 30450220616e0cdba7a38e9b489733ac51c42b95ae66981dafa1b372052a691b02ce386102210096d3009a7097a771e0fadc01aaa3adfb2747cfcfd12f3a085682b992e0e10b98. We can use this message signature so we can pass it to someone else as under the Verify section public key:
042ac26b7478680324b15947678bbfc3bb1ac7cc9006f3596d90a4add35590c716454a3ab05eef4fc8009e0fcb110cefc3b47a2728ed3ef79e0ef3b657dfbc4723
is generated so no one can get a glimpse of my private key. So given this message and everybody knows the public key and given the signature that we just made, now we should be able to verify it by clicking the verify button and the screen goes green, and message is valid.

Let's put some structure around it in a scenario of a transaction, where under the transaction tab under message section let's put $20 token amount which will be transferred from
042ac26b7478680324b15947678bbfc3bb1ac7cc9006f3596d90a4add35590c716454a3ab05eef4fc8009e0fcb110cefc3b47a2728ed3ef79e0ef3b657dfbc4723
public key of mine to someone else public key
04cc955bf8e359cc7ebbb66f4c2dc616a93e8ba08e93d27996e20299ba92cba9cbd73c2ff46ed27a3727ba09486ba32b5ac35dd20c0adec020536996ca4d9f3d7 as I have my private key displayed to me , I can use my private key to sign the message or to verify the transaction for secure transaction that is about to be conducted.

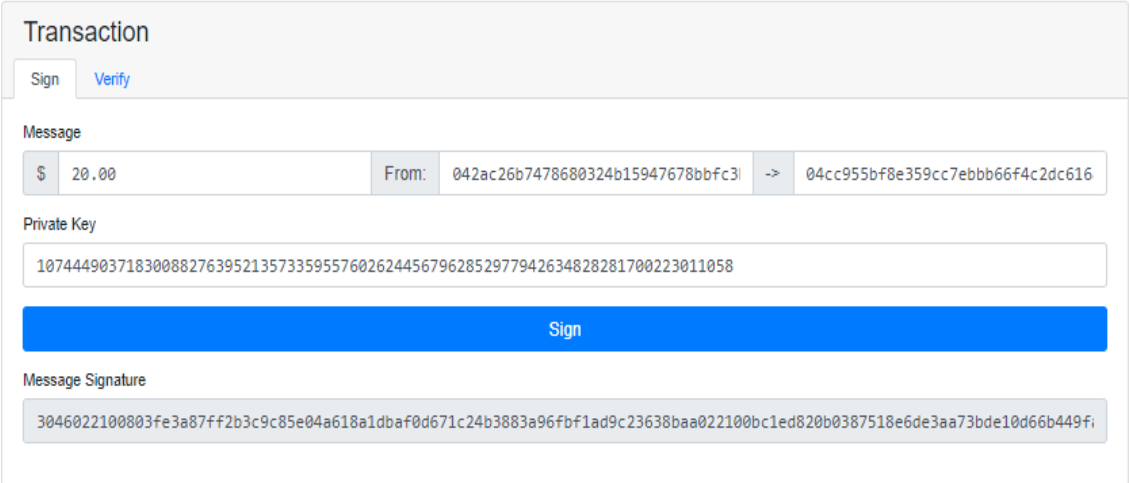


Figure 22 MESSAGE SIGNATURE TRANSACTION

Clicking into the verify tab and varying the transaction we can be sure that the message which is $20 that verify the private key which is the holder is sending the money from its public key to the someone else's public key and the transaction gets verified. now using this concept in the Blockchain to transfer the token from one account to another blockchain account. So as we previously worked in similar concept we can see in the peer A Block 2 for instance with Nonce 25205 an amount of $10 is sent from the public address
04fe1be031bc7a54d900ff062911bc4f7ba0edb39e4280268e490b79e347e3b8b0019c252aad7536ef7caeb061d558cac2eaec43ff670d76a521bec77c35751310 to the public

address 04cc17dc129331c1cbb9c32cf4dc2dde4a5144e26c09b7430685c227176aeed05c74cf9d581da9d872cff53e67a8b28c53dfcf197dc4148e476eff4c3abfb3eebd once the transaction is carried out and verified with the digital signature the blockchain is executed and there is no turning back .

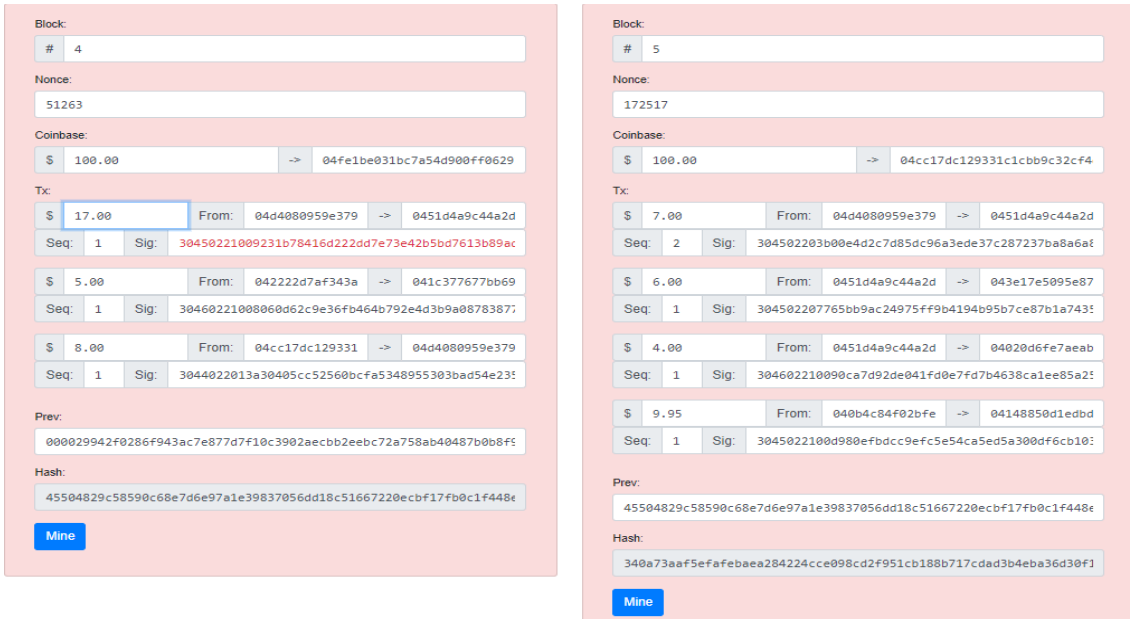


Figure 23 BLOCKCHAIN PUBLIC/PRIVATE KEY

But if we will try to make changes in any of the ziplines of the block for instance at Block 4 then we can see that Block 4 and Block 5 turns red and not only that it also broke the signature and the signature is not verified and that's why the signature is turning red so while we can click the mine the block and remain the block, they are going to end up with something where the block is signed which should eventually happen and turn the Block green but a signature will still be in red or will be invalid because the miner will not have the private key only they have is the Public key so they cannot come up with the right signature. so that the way we can make sure this transaction here was posed by the particular address or the person who had the money or the token and the only person not just anyone else on the internet.

This way public/Private key Pair message signing is used in the Modern days to protect the transaction. Now if we think about it, it works well because to create a new address or a new public key the only thing you have to do is go back and come up with the new private key a new random number. You didn't have to go to a centralized authority to come up with the public-private key and you derive the public key from it and you put that out there as your address, and that's how people can transfer the token or receive the token.

Using High-level Object-oriented Language Solidity

The final Method to create a proposed sample cryptographic token is by using this Programming language Solidity. To understand briefly about the programing language. It is an Object-oriented high-level programming language for implementing smart contracts that is curly bracket language that has been highly influenced by C++, javascript, and Python and designed specially to target the Ethereum Virtual Machin EVM. Solidity is statically typed and includes inheritance, libraries, and support for complex user-defined types.

We can use this language for voting, crowdfunding, multi-signature crypto wallets, and blind auction by creating a contract. But when publishing the contract, we should use the latest version of the Programing language that provides us with sufficient fixes with security.

Conceptual Modeling of Cryptographic Token and Analysis of Use of Blockchain Transaction

Developing a sample Cryptographic Token as one of the uses of Blockchain Technology using the Programming Language SOLIDITY and Demonstrating how the developed token can be deployed in the Blockchain. An analysis of the use of the Blockchain technology other future benefit and usages.

Proposed Use of Blockchain in Model

There are many Blockchains like Bitcoin, Ethereum, Cardano, Binance smart Chain, and others. We could pick any of the Blockchain to create the Token to show one of the uses

of the Blockchain technology. We could have used the Bitcoin blockchain for the transaction generation but is without the smart contract and it's straightforward. We also have Cardano which is a bit advance but doesn't have the smart contract yet and will have later, in another hand, we have Ethereum Blockchain that introduce the Smart contract and was/is widely used for decentralized transactions. But moving on to the Modern days the Binance smart chain overtook the Ethereum smart contract transaction volume because it was quick to update the module and provide the smooth transaction model to the user. As the gas fee of Ethereum became high and Binance was comparatively low. In short term, the Binance Smart chain is dragging maximum users with its smart contract. So, to fulfill the modeling conceptual use of Blockchain technology here I have used the Binance smart chain.

To understand the Binance Smart chain we previously discussed in the Chapter regarding the Version of Blockchain. So, it's almost the same as the Ethereum Blockchain but a bit upgraded version of Ethereum as in Ethereum any user can participate freely and be a miner but the Binance smart chain the user should be pre-approved for mining. So, the method that we use here for the Token creation is almost the same in the Ethereum network. Binance smart chain runs within the network of computers known as Node which is the software of the Binance smart chain. The smart contract makes the Binance blockchain strong where its native currency BNB token is used to transact between one address to another. As smart contracts are the Little Program that runs on the blockchain and is irreversible and cannot be stopped once it's deployed in they run forever. So here comes the Part where the SOLIDITY is used, it is used to write the smart contract and has the syntax that is similar to the JAVA script but works in a completely different manner. Just to be clear Cryptocurrencies and token both lies in the Blockchain but the cryptocurrencies are native digital currencies of Blockchain like Bitcoin and Ether but the Crypto token is the digital currency that is dynamically created on demand and can be deployed any time. Blockchain doesn't have any idea about the Crypto token it only knows how to run the Smart contract. It doesn't care what you run in it is a token, decentralized exchange, or anything. Blockchain knows only what smart contracts your code to make some use of Blockchain technology.

Coding Crypto Token Using Smart Contract As Use Of Blockchain In Modern Days Technology

For coding the Smart contract as one of the uses of Blockchain Technology we will use the online code editor called https://remix.ethereum.org/. Then under the tab Solidity Compiler, we have to make sure the correct version is chosen Solidity 0.8.2 and under the file explorer, we have to create a file. A file name ISMA.sol where .sol is the extension for the solidity program is created.

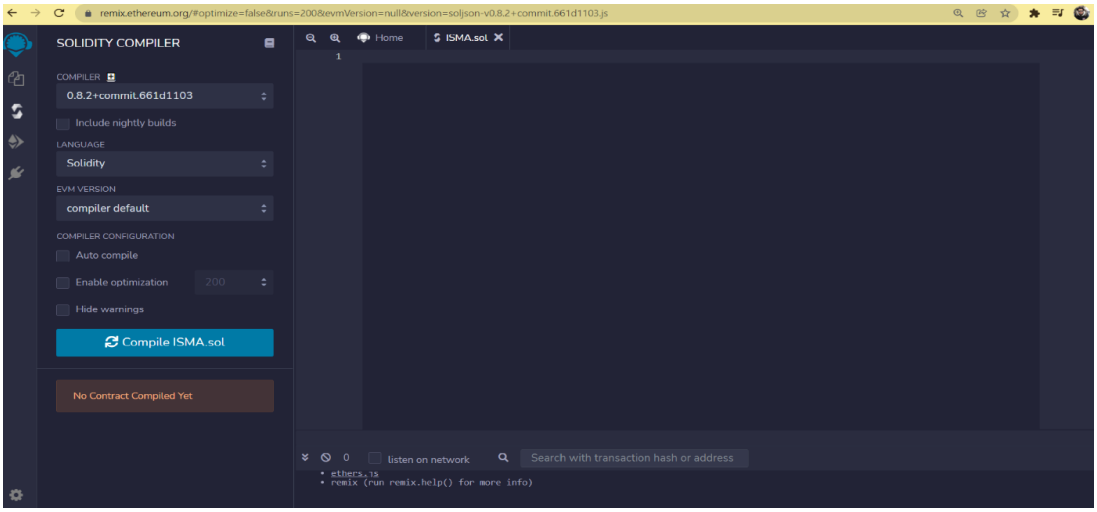


Figure 24 CREATING SOLIDITY FILE

First, we use the pragma statement to indicate the version of the solidity that is being used and, in our case, we use pragma solidity 0.8.2 and after that, we use the name of the smart contract that we are creating and, in most cases, it's same as the name of the file and for our case the Smart contract name is ISMA.

Figure 25 DEFINING VARIABLE IN ISMA.SOL

Understanding the code written the variable can be defined as public since everything is public in the blockchain we use the public variable even if we use the private variable the concept of blockchain makes it public so we should be aware that even we use the private variable it is public and can be read. In line 4 we have considered the total supply of the token to be 1000 followed by the decimal number 18. Where ** in the solidity language is the power to. Providing the metadata of the token we have given the name of the token to be “ISMA Token” and line 6 displays the symbol of the token as “ITK” that can be used in the exchanges to trade the token either to buy or sell the token. Line 7 with decimal value 18 defines the smallest fraction of the token that can be transferred. So, in this case, it will transfer 10 * 18 but on the wallet side, it will show us one token. We can add a mapping function mapping(address => uint) public balanceOfAccount; where mapping is a key-value store that will allow us to use a series of records. so that we are using the address and mapping it to unit.

We will define a constructor and a constructor is a code that will only execute once when we deploy the smart contract.

```
constructor()
  {
    balanceOfAccount[msg.sender] = totalSupply
  }
```

We can pass data between the parenthesis of the constructor but in this case, we won't pass any. in our case we will send all the supplies of the token to the address that will deploy the smart contract so here in solidity we can update the record in mapping is by placing them between the square bracket. using the build-in method in solidity msg. a sender which is the address that sends the transaction and when deployed the smart contract this is a transaction. Here whoever deploys token will receive all the tokens of total supply and in general it will be the admin one who receives all the supply. admin can distribute the toke differently like airdrop and others. This is how the life cycle of the token starts.

we in this case will be creating a function that will read the balance in any address and we will call the function as balanceOfAddress.

```
function balanceOfAddress(address owner) public view returns(uint) {
   return balanceOfAccount[owner];

}
```

We pass the argument in the parenthesis with its data type and the name of the argument in our case its owner. We placed it as public so it can also be called from out of smart contract but we could also place it as private so it could only be called inside from the smart contract. After that, we will create a function to transfer tokens from one address to another address and call the function transfer

```
function transfer(address to, uint value) public returns(bool){
    require(balanceOfAddress(msg.sender) >= value, 'low balance');

 }
```

Here in the argument, we take the recipient address and the value of how many tokens we want to transfer in terms of the token fraction for example if we want to transfer 1 toke value, we pass one times 10 * 18 as 18 is the power of decimal and it returns the Boolean value. Here the required statement allows us to test the logical condition and if the condition is true the execution of the transaction continues else the transaction gets

canceled so we always have to make sure there is enough token to do the transfer. if we have a balance of 2000 then we cannot spend 3000 tokens. we can compare from the required statement that if the balanced address of the sender is less than the actual value that is to be sent it displays the error message ' low balance '

Figure 26 DEFINING FUNCTION TRANSFER

If the balance condition passes from line 25 it will continue and update the balance of the account of the recipient as in line 26 this increases the account value of the receiver and line 27 will decrease the account value of the sender. An event is a data package that can be emitted from a smart contract and can be abstracted from outside the smart contract.

```
event Transfer(address indexed from, address indexed to, uint value);
```

Now using the event in the function transfer

```
function transfer(address to, uint value) public returns(bool){
    require(balanceOfAddress(msg.sender) >= value, 'low balance');
    balanceOfAccount[to] += value;
    balanceOfAccount[msg.sender] -= value;
```

```
    // using emit
    emit Transfer(msg.sender, to, value);
    return true;
}
```

It returns true as the return of the function transfer is a Boolean value

Now a function is created to do a delegated transfer, with the delegate transfer it is possible for one address to spend a token on behalf of another address and is widely used by the decentralized exchange as they can manipulate the token so instead of sending the token directly to the address of the smart contract it usually allows us to spend a token on our behalf and then this smart contract code will pull the token from our address to its address.

```
mapping(address => mapping(address => uint)) public allowance;
```

adding mapping function again we have here the nested mapping

a. 0x8956322248easdq => 20000

b. 0x8956322248easrt => 40000

c. 0x8956322248eer6e => 60000

for example, you can allow the different addresses to spend a specific amount of token on behalf of you like a can spend 20000 tokens, b can spend 40000, and c can 60000. It's just an example to show what allowance means.

```
event Approve(address indexed owner, address indexed spender, uint value);
```

adding another event for the Approve of the allowance. creating function *approval* to set the allowance.

```
function approve(address spender, uint value) public returns(bool) {
    allowance[msg.sender][spender] = value;
    emit Approve(msg.sendre, spender, value);
    return true; }
```

so, we add the approved address of the spender and the amount the spender can spend on behalf in the argument followed by the public function that returns a Boolean value. so here the spender has approved allowance of the dedicated amount of token that the

sender has allowed for the spender to spend token that belongs to the sender. Now a function is created to delegate the transaction.

```
function transferFromAddress(address from, address to, uint value) public re-
turns(bool) ;
   require(balanceOfAddress(from) >= value, 'low balance');
   require(allowance[from][msg.sendre] >= value, 'low allowance amount');
   balanceOfAccount[to] += value;
   balanceOfAccount[from] -= value;
   emit Transfer(from, to, value);
   return true;
```

Here the from is the sender and the to is the receiver of the token value is the amount of token that is supposed to be transferred in the argument section. whereas in next line transaction only execute if the sender address has enough token else it displays ‘low balance’ message and moving down another line allows the transaction if the sender allowance amount is greater than the amount entered to transact else it displays ‘low allowance amount’ message. After this, the next line updates the account of the receiver with the new amount received, and following the line, the next line updates the new balance amount available after the transaction is conducted from the sender account and returns the Boolean value.

Implementation of The Modelled Crypro-graphic Token Deploying Through Metamask Extension

Metamask is an extension to access Ethereum-compatible decentralized applications, or "Dapps," in your browser and this extension injects the Ethereum web3 API into the ja-vascript context of each web page so that Dapps can read from the blockchain. It also allows users to create and manage their own identities and it requires read and writes permissions to any web page. So for this, we will add an extension of the Metamask and create a Metamask wallet.

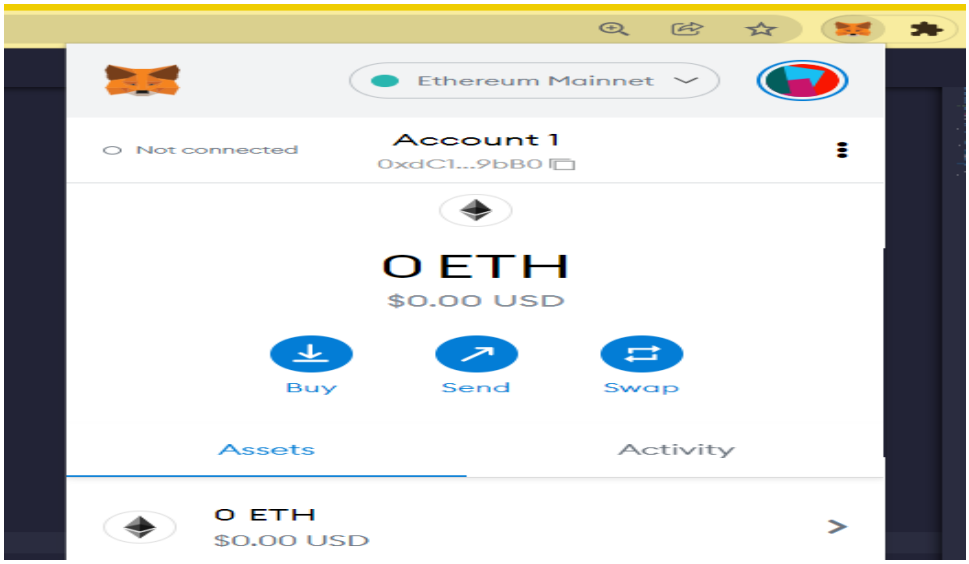


Figure 27METAMASK WALLET

Now to get the free sample Binance token we can get it from https://testnet.binance.org/faucet-smart. The Binance smart chain faucet is the safe playground that we can use when we are trying to deploy our smart contract in the Binance smart chain. To deploy our smart contract, we need some test net BNB tokens so we can get them from the balance smart chain faucet test net (Yadav, Raj, Gautam, & Tripathi, 2023). First, we open our Metamask extension and copy the Account address to the Binance smart chain faucet, and request for the 1 BNB token to the particular address by clicking the Give me BNB.

After that, to get the Balance we first must go to the Binance test net https://academy.binance.com/en/articles/connecting-metamask-to-binance-smart-chain and get the detail of the Test net that the Binance have provided, and in this case, we get Testnet Network Name: Smart Chain - Testnet

New RPC URL: https://data-seed-prebsc-1-s1.binance.org:8545/

Chanel: 97

Symbol: BNB

Block Explorer URL: https://testnet.bscscan.com

Next, we have to move back to the Metamask wallet and add a network using the received information from the Binance testnet. After that, we finally get our Metamask wallet updated with Token

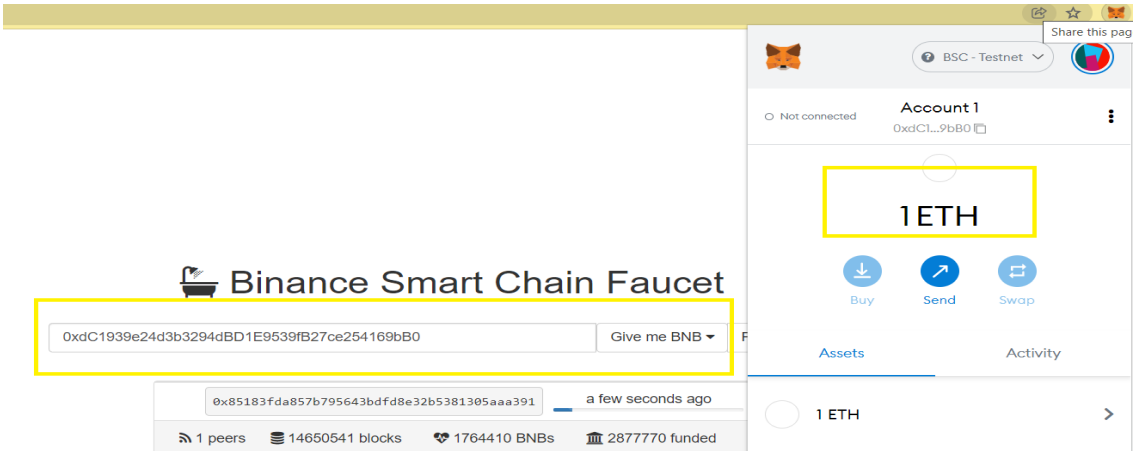


Figure 28 BINANCE SMARTCHAIN FAUCET

Next, we have to connect the remix.ethereum.org to the Metamask wallet so for that under the run and deploy tab we change the environment to the Inject Web3 that helps us to connect the wallet to the Deployment environment and we have to choose Account 1 where we had the faucet token from the test net.

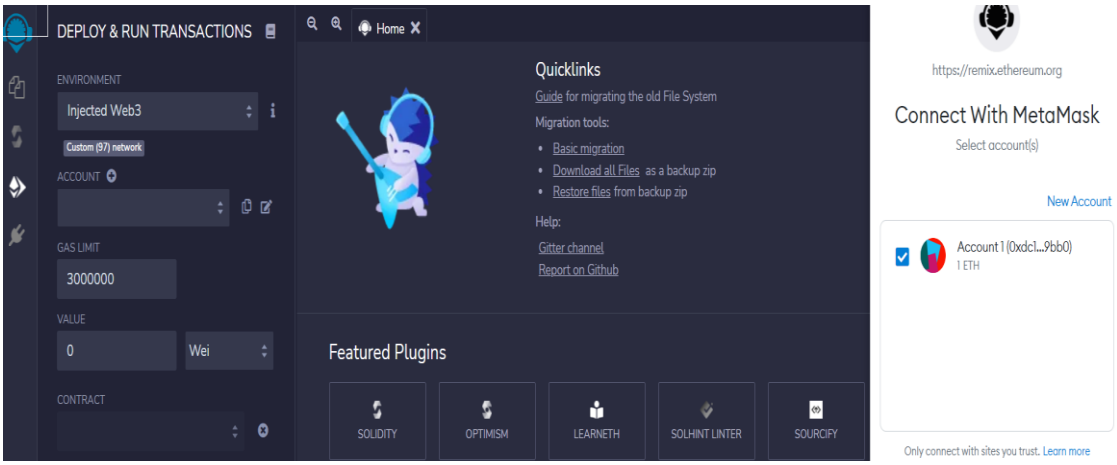


Figure 29 DEPLOYMENT IN METAMASK

We can see how the account is linked for the deployment under the Injected web3 environment where 0xdC1939e24d3b3294dBD1E9539fB27ce254169bB0 account is

connected having 1 ether token. It shows 1 ether as the Metamask wallet is originally designed for the Ethereum Blockchain. The gas limit section displays the amount of transaction fee that it charges per transaction so for our token, we will leave it as default 3000000. Now once we click on the Deploy tab the token gets connected with the Meta-mask wallet.

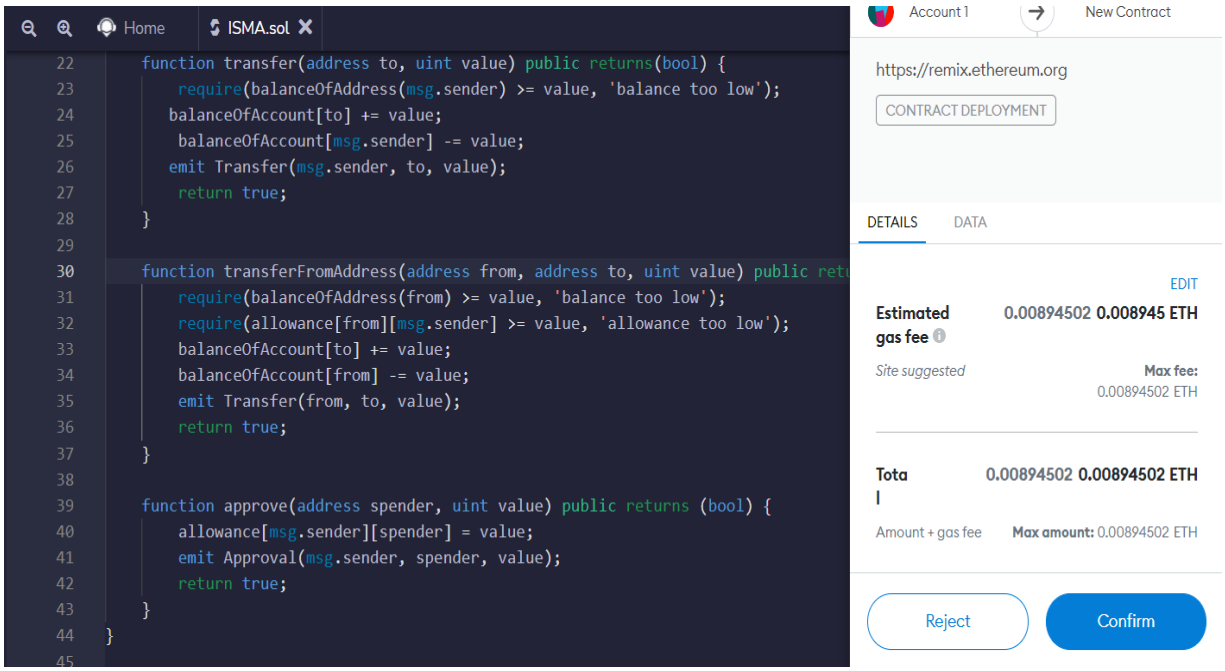


Figure 30 GASFEE FOR DEPLOYMENT IN BLOCKCHAIN

Once clicking on the confirm button agreeing to the Gas fee for the token to get deployed in the Blockchain we have to wait for a few minutes for the transaction to get mined. So, after that mining was succeeded and executed with the transaction hash 0x94cc103f481a7f4f5dea0940569d7c485eedc2bf169313c0e6cbba08fb8c0a30 sender 0xdC1939e24d3b3294dBD1E9539fB27ce254169bB0 which is our Metamask Address and the receiver is the constructor that we have created ISMA with the transaction cost of 894502 which is also called gas fee.

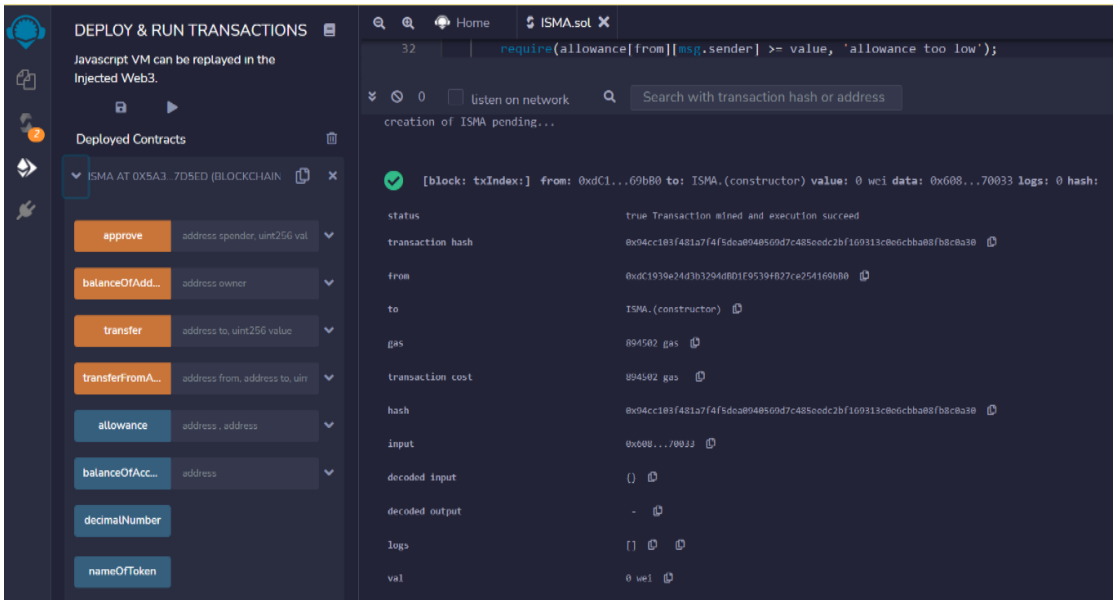


Figure 31 TRANSACTION MINING

So once the Token ISMA is successfully been created, we have to check by carrying out some transactions by transferring the token to a different address. For this reason, we can take randomly generated addresses from a site called Vanity-ETH.) address generator. From this we get a randomly generated address to be sure that the ISMA token can be transfer 0x0C4972cb4CE641b1409B719345f1cf3F1e7b5F8c. Once we place this address under the transfer tab.

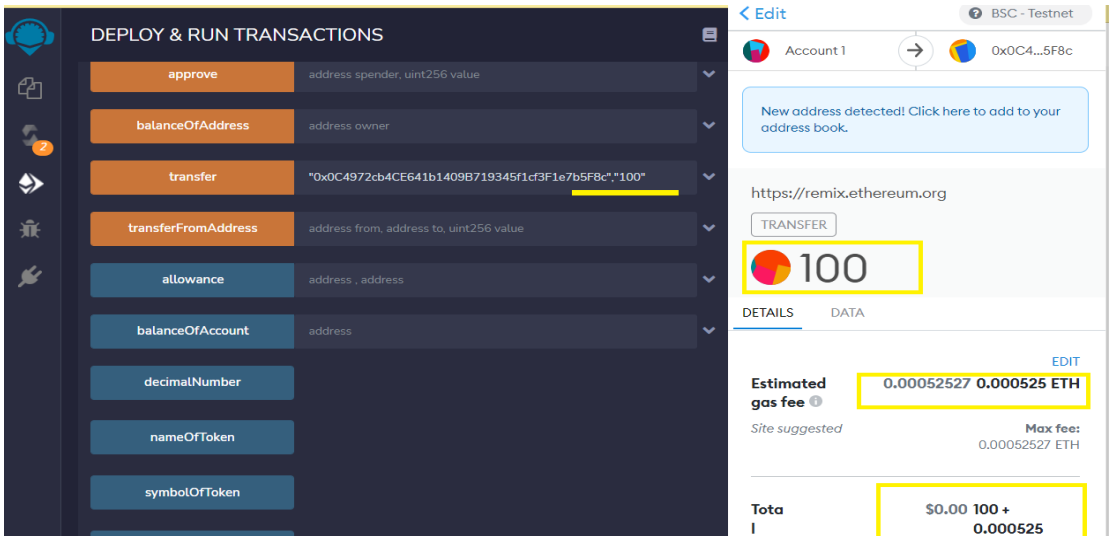


Figure 32 TRANSFERRING ISMA TOKEN

To check if the ISMA token can be transferred from one address to another we tried to send 100 ISMA tokens to the randomly generated address and it shows for the transaction to get completed it takes 0.000525 BNB token as gas fee or transaction fee. After the transaction is completed, it generates a hash, and to check if the ISMA token was sent to the particular address we can check it under the tab balance of the Account by placing the address that we have generated randomly from the vanity-ETH.

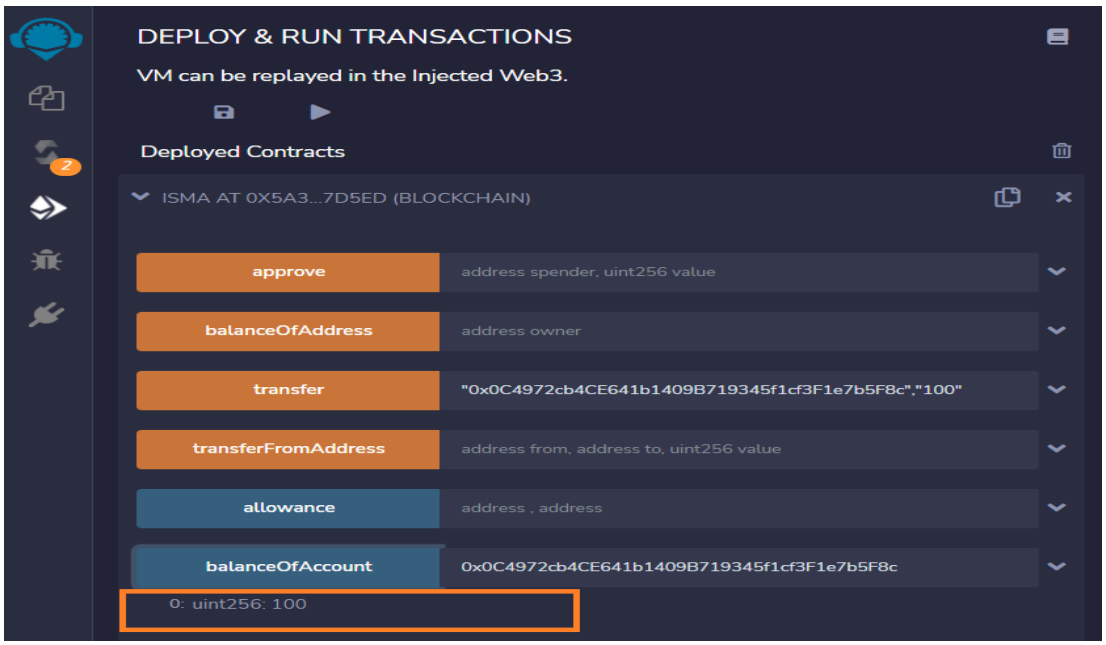


Figure 33 BALANCE OF ACCOUNT

As we had made 100 ISMA token transfers we can see that the Account balance of the recipient account is 100. This is how we have successfully created a Token ISMA as a Use of Blockchain Technology, deployed the token our smart contract to the test net of Binance smart chain, and use the interaction of the smart contract. For Real-world use, we can use this ISMA token using the Main net of Binance blockchain instead of the Test net and give it a real-world value.

Developing a cryptographic sample as one way to use Blockchain technology using the SOLIDITY programming language and demonstrating how the designed token can be placed on a blockchain. Analysis of other future benefits and applications of using blockchain technology.

Blockchain such as Bitcoin, Ethereum, Cardano, Binance Smart Chain and many more. We could choose any of the Blockchains to create a token that shows one of the uses of Blockchain technology. We could have used the Bitcoin blockchain to create transactions, but that is without a smart contract and it is simple. We also have Cardano, which is a little ahead but does not have a smart contract yet and will come later, on the other hand we have the Ethereum Blockchain implementing a smart contract which was/is widely used in decentralized things. But moving to the present day, the Binance Smart Chain surpassed the Ethereum Smart Contract transaction volume because it updated the module quickly and provided a smooth transaction pattern to the user. Ethereum gas fees rose high and Binance was relatively low. In the short term, the Binance Smart Chain will attract as many users as possible with its smart contract. So to implement the conceptual use of Blockchain technology for modeling, I have used the Binance Smart Chain. We use the online code editor https://remix.ethereum.org for coding the smart contract as one way to use Blockchain technology. Then, in the Solidity Compiler tab, we need to make sure that the correct version Solidity 0.8.2 is selected and in the file browser, we need to create a file. We will create a file called ISMA.sol, where .sol is the extension for the stability program. The token encoded in Solidity should now be used on the testnet. Therefore, we need to implement the modeled cryptographic token by enabling it with the Metamask plugin. Metamask is a plugin for running Ethereum-compatible decentralized applications or “Dapps” in your browser, and this plugin adds the Ethereum web3 API to the JavaScript context of every web page so that Dapps can read from the blockchain. It also allows users to create and manage their own identities and requires read and write permissions on any web page. To do this, we will add the Metamask plugin and create a Metamask wallet. we need to connect remix.ethereum.org to the Metamask wallet, so in the Run and Deploy tab we change the environment to Inject Web3 which will help us connect the wallet to the deployment environment and we need to select account 1 where we had the faucet ID from the testnet.

We can see how the account is linked for deployment in the Injected web3 environment where the account 0xdC1939e24d3b3294dBD1E9539fB27ce254169bB0 is linked with 1 ether ID. It shows 1 ether because the Metamask wallet was originally designed for the

Ethereum Blockchain. The Gas Limit section shows the amount of transaction fee charged for each transaction, so for our ID we will leave it at the default value of 3000000. Now when we click on the Deploy tab the token is connected to the Metamask wallet. After clicking the confirm button and accepting the gas fee to deposit the token into the Blockchain, we need to wait a few minutes to receive the transaction. So after the mining was successful and completed with the transaction hash 0x94cc103f481a7f4f5dea0940569d7c485eedc2bf169313c0e6cbba08fb8c0a30 the sender is 0xdC1939e24d3b3294dBD1E9539fB27ce254169bB0 which is our metamask address and the receiver is the constructor we created with the ISMA transaction fee, 894502 which is also called gas fee. Once the ISMA token is successfully created, we need to verify by making some transactions by transferring the token to another address. For this reason, we can get randomly generated addresses from a website called Vanity-ETH.) address generator. From here, we get a randomly generated address to ensure that the ISMA token can be sent 0x0C4972cb4CE641b1409B719345f1cf3F1e7b5F8c.

To test whether ISMA token can be transferred from one address to another, we tried sending 100 ISMA tokens to a randomly generated address and it shows that 0.000525 BNB tokens are required to complete the transaction as a gas fee or transaction fee. Once the transaction is completed, it generates a hash code, and to verify that the ISMA token has been sent to a specific address, we can check it from the balance in the Account tab by adding the address we randomly generated from vanity. ETH. 100 ISMA Token transfer, we see that the recipient's account balance is 100. Thus, we have successfully created the ISMA token using blockchain technology, deployed our smart contract token to the Binance smart chain testnet, and used smart contract interaction. For real-world use, we can use this ISMA token using the Binance blockchain mainnet instead of the testnet and assign it a real value.

Developer Blockchain token can be used as a reliable and transparent source for any tracking transaction that can provide real value. When deciding the total supply of a token, the token can be for any daily transaction because it can be created as a decentralized structure in any organization and for the transaction to be created, as we explained above, the transaction can be restricted to fast and reliable information flow. The use of

blockchain technology can help control corrupt governance when the supply of tokens becomes limited and it can be done digitally with a unique digital signature that reduces the hiding of cash or black money. In addition, the technology can be used for any other transaction between two parties without a centralized authority.

This can leave a tamper-proof record that cannot be changed in any other way. It can change the transparency and distributed value of the traditional organization with the dynamic power. The use of distributed ledger technology can replace the traditional paper or system-based method. Central banks could adopt blockchain for one of its uses, for example, we have developed a cryptographic token and it is widely used in society. The use of technology significantly reduces the cost of transactions and completes the transaction faster than the usual traditional payment method with high bank fees. It can also be the best platform for trading any goods. The blockchain market is predicted to be the largest and reach 163 billion by 2026, and it will continue to grow with upcoming technologies such as Metaverse, where NFT tokens are created on the blockchain. The man's suggestion at the end of this thread is that the Designed Token can be used as the official token of University of Vaasa for all internal decentralized transactions of the university. Currently, the total supply of tokens is 1 quadrillion and the gas fee is 300,000 tokens per transaction, and it can also be introduced to the network for real-world use by setting the price of the token in a liquidity pool. (e.g. 1 euro = 100,000 ITK)