Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics (FEM)

Master's Thesis

Blockchain Investment into Crypto Art

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Thesis title

Blockchain Investments into Crypto Art

Objectives of thesis

Aims

The main aim of this research is to analyze the use of the blockchain technology in the crypto art.

The aim is to do the study on the future of the technology as well as the cryptography used in the crypto art.

Objectives

The goal of blockchain technology is to enable the sharing and recording of computer data in an un-editable manner.

Discover some of the benefits of blockchain to gain a better understanding of its potential use in various industries.

The ability of Ethereum and other blockchain platforms to store and execute computer code has led to an increase in the number of use cases for this revolutionary technology.

Methodology

Methodology

Data collection

Qualitative data

Qualitative data can assist in ensuring that the study's standing data is correct and appropriate and that the study's relevant phenomena are adequately comprehended. It aids in allowing for flexibility in the usage of the gathered data. The use of subjective data-collecting techniques can make the detailed analysis simpler. The study's material facts can be appropriately classified and applied in a specific context (Kim et al., 2021). The accessibility of the study's data is improved, and the security of the data may be preserved, which contributes to a better comprehension of the data.

Quantitative data

Approach for data analysis

Previous research has demonstrated how exchanges affect pricing. The information can be quantified with ease, and its stability can be guaranteed. Using Excel may make it simple to show data graphically, analyze it, and validate the results. Through the employment of tools for interpretation, data processing, and testing are made feasible. The study may be made accurate and realistic by ignoring the immaterial facts and using materialistic data instead

The proposed extent of the thesis

60 pages

Keywords

Cryptocurrency ,Blockchain, Value generation, Crypto art ,Payment Channel, Bitcoin, Non-fungible token (NFT)

Recommended information sources

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Declaration

I declare that I have worked on my master's thesis titled " **Blockchain Investment into Crypto Art** " by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 30/03/2023   _____

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I would like to thank doc. Ing. Petr Procházka, MSc, Ph.D., and all other individuals for their assistance and advise during my work on this dissertation. Further gratitude is extended to all Professors and Lecturers in the Economics and Management Faculty. Following will be my family and friends back home, as well as those I've made throughout my time as a student in Prague.

Blockchain Investments into Crypto Art

Abstract

Crypto culture is a relatively new artistic style that entails the artist creating masterpieces, often still or motion graphics, and distributing those through a cryptocurrency art gallery or through a media channel that uses smart contracts. We developed a "decentralized" policy paper on blockchain art, which incorporates comments from many actors inside this system, to demonstrate the concept from several angles and to underscore open difficulties (Ghosh et al., 2020).

This research intends to investigate the application of blockchain technology in crypto art and its future prospects. Blockchain technology enables the sharing and recording of computer data without the need for editing, which provides numerous benefits to the sector. The study demonstrates that investing in NFTs can be profitable, but it is crucial to examine the ROI, NPV, and payback period for each NFT prior to investing. In addition, the substantial positive correlation between the purchase and selling prices for each NFT shows that investors should assess the original purchase price with great caution. Blockchain has the potential to transform the crypto art business due to the rising variety of applications for this technology, as well as its power to store and execute computer code.

Keywords: Cryptocurrency, Blockchain, Value generation, Crypto art, Payment Channel, Bitcoin, Non-fungible token (NFT), Application Programming Interface (API), Ethereum, Cryptocurrency mining

Blockchain investice do Crypto Art

Abstrakt

Krypto kultura je relativně nový umělecký styl, který znamená, že umělec vytváří mistrovská díla, často stále nebo pohyblivou grafiku, a distribuuje je prostřednictvím umělecké galerie kryptoměny nebo prostřednictvím mediálního kanálu, který využívá inteligentní smlouvy. Vyvinuli jsme" decentralizovaný " politický dokument o umění blockchainu, který zahrnuje Komentáře mnoha aktérů uvnitř tohoto systému, abychom demonstrovali koncept z několika úhlů a zdůraznili otevřené potíže (Ghosh et al., 2020).

Tento výzkum má za cíl prozkoumat aplikaci technologie blockchain v krypto umění a její budoucí vyhlídky. Technologie Blockchain umožňuje sdílení a zaznamenávání počítačových dat bez nutnosti úprav, což odvětví přináší řadu výhod. Studie ukazuje, že investice do NFT mohou být ziskové, ale je zásadní prozkoumat ROI, NPV a dobu návratnosti pro každý NFT před investováním. Podstatná pozitivní korelace mezi nákupními a prodejními cenami pro každý NFT navíc ukazuje, že investoři by měli původní kupní cenu hodnotit s velkou opatrností. Blockchain má potenciál transformovat podnikání v oblasti krypto umění díky rostoucí rozmanitosti aplikací pro tuto technologii a také díky své schopnosti ukládat a spouštět počítačový kód.

Klíčová slova: kryptoměna, Blockchain, generování hodnoty, krypto umění, platební kanál, Bitcoin, nezaměnitelný token (NFT), aplikační programovací rozhraní (API), Ethereum, těžba kryptoměn

Table of content

1. Introduction

Tokens that can be used to prove ownership of a specific digital or physical item are called non-fungible tokens (NFTs).

Hence, NFTs can be used to tokenize anything that has the potential to be uncommon or exclusive, such as a work of art, futures contract, music score, book, piece of real estate, etc. Due to the immutable nature of the blockchain, crooks cannot steal or tamper with NFTs while they are being mined, stored, or transferred.

The issue of counterfeiting can be solved with the use of NFTs because they can provide immediate verification of authenticity and provenance. NFT sales hit a new high of $2.5 billion square in the first half of 2021. (Jordan, R. (2021, July 5). NFT Sales Hit $2.5 Billion in H1 2021. Decrypt.)

A general phrase called digital art was created to describe the blending of art with blockchain technology. Cyber art aims to preserve irreversible forms of digital art, including music CDs, paintings, medals, and a broad variety of artifacts, as a sub-ecosystem inside the realm of cryptocurrency. The blockchain stores cryptographic works of art in the form of no fungible currencies, or NFTs, which are typically associated with financial worth (Abdou and Elnasr, 2021). Similar to conventional art forms, the legitimacy of the artist, the rarity of the work, and its desirability in the collector's community all have a significant effect on the value of cyber art or NFTs. NFTs and related types of electronic art may have their legitimacy and ownership changed publicly thanks to their collectible status. As a result, each work of art may be independently verified as unique and have a commensurate market value. Let's explore the realm of cryptography art in more detail (Abdou and Elnasr, 2021).

Because of nonfungible currencies, cryptographic art is made feasible. While similar to other digital file formats like JPEG, GIF, and create 3d, NFTs have metadata that may be used to demonstrate their worth and possession on the blockchain system. NFTs have developed into portraying real-world items in metaverses and also other virtual social worlds as a result of the limitless possibilities provided by digitization (Abdou and Elnasr, 2021). Retail sales of digital clothing, footwear, real estate, as well as other commodities and goods are made easier by online virtual storefronts. Furthermore, a specific label's or entity's desire from the general public and its rarity both influence the genuine market value of NFTs. The release of music CDs and the distribution of prizes and fan tokens at major sporting events are a few instances of NFT acceptance in the mainstream. In addition to depicting elements of the

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physical world, artists make use of this emerging industry to produce work and sell it to customers throughout the world. This offers enthusiasts the chance to replicate well-known artworks and provide collectors with valuable historical pieces (Agarwal et al., 2021).

Although profitable, the NFT industry has created new opportunities for dishonest people who prey on gullible investors and collections. Investors and aficionados are urged to do extensive study on the NFTs before committing any investments or acquisitions, just as with any other environment involving cryptocurrencies and private blockchain (Agarwal et al., 2021). Investors should verify the NFTs' information on the associated blockchains just as carefully. In the context of NFTs, metadata includes facts on minting, the network host, possession, and the author. Information is a term that describes extra information about a certain item or instance. The sole means to verify the validity of a cryptocurrency art offering may be thought of as the data present on the blockchain (Agarwal et al., 2021).

Cryptocurrency serves as a means of exchange, a measuring unit, and an account number. Cryptocurrencies is used to determine the worth of various other assets even though it has no inherent value. The first technology innovation was established in 2009 and therefore is known as bitcoin. Although it is a currency system of exchange, it may also be seen as a trading asset depending on how much it sells for (Agarwal et al., 2021). Blockchain and encryption enable virtual version of value, sometimes known as digital currencies. At first, they served as a way to transfer wealth without the need of a government or another trustworthy institution. A system for mentoring electronic currency system was likely designed by Satoshi Nakamoto in reaction to the worldwide financial sector meltdown (Agarwal et al., 2021).

The distributed ledger operationalized as blockchain technologies is based on this protocol. Similar to a world record or sheet, cryptocurrency works. It lacks a centralized database and runs on computers donated by volunteers all across the world. Anyone may look at a blockchain at any time since it lives on the network rather than inside a single company (Al Barghuthi, Ncube and Said, 2019). A blockchain is coded and uses private key to maintain a certain level of artificial security. Without using a bank or another financial firm, a person can transmit money to some other person securely via a blockchain. Blockchain is a technological advancement. It is a bit of academically challenging code that is integrated into digital content. Everything from a paper to a video clip or even money can be considered

a technological asset. A secure, virtually extremely secure record of events is produced by blockchain technology (Al Barghuthi, Ncube and Said, 2019).

A method is used to create a set of specified-length integers and characters called a hash. The individual's result is the hashing. The input consists of a list of any size of integers and characters. In this situation, the hash is comparable to the block's condensed identity. Every block has a distinct hash that identifies and distinguishes it, much like a passport. The hash also varies if the blocks undergo any modifications. Consequently, because its fingerprint has changed, it is no more the same block (Al Barghuthi, Ncube and Said, 2019). The hashing of the block before it serves as the third element of data in the block. Consider a chain of blocks. Block two stores the hashing of block one, block three stores the password of block two, and so on. Thus, a chain is formed. The hash of block two would change if the content in block two is altered. Therefore, the new, altered hash from block two will no longer match the old code recorded in block three. As a result, the remaining blocks are unnecessary. Blockchain's technological behavior is what makes it so safe (Al Barghuthi, Ncube and Said, 2019).

All works of art that have been tokenized using blockchain-based are referred to as crypto art. These are limited-run digital artworks that come in the form of pictures, movies, or GIFs and include special tokens. This enables artists and consumers to purchase, offer for sale, and exchange digital objects just like real ones. Since the documents are tokenized, there is a guarantee that there are only a finite number of parts of the artwork that have been approved by the creator, which enables its worth to be traded (Ante, 2022). Due to safe distributed ledger technology, every signature here on the file itself is irreversible and non-fungible. Probably the most crucial piece of information you want when acquiring an artwork is provenance verification. Keeping track of the certifications of authenticity is challenging having a sizable body of artwork. All of this is made simpler by blockchain, which makes your credentials safe and simple to maintain. Additionally, it gives a secure way to buy genuine, original artwork. The expanding market for cryptocurrency art also enables aspiring and seasoned collectors to assist up-and-coming creators and fund digital media. Additionally, now is an excellent moment to join the craze when entry-level collectors can still afford it (Ante, 2022).

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Limited-edition artwork that is documented cryptographic keys among a coin on a network is identified as crypto art. For an effort of digital art, tokens provide a clear, verifiable origin and history. Without the assistance of other parties, tokens may be kept and safely exchanged thanks to blockchain technology (Ante, 2022). Because of the intangible and distributive character of art, the close relationship between art and money, as well as the disdain for traditional art marketplaces and institutions, cryptocurrency art has its roots in conceptual art. The authors suggest a selection of perspectives on cryptography art from various system players, including computer scientists, art historians, collectors, museum curators, and artists. Main themes and unresolved problems are identified (Bai, 2019).

In this transaction, a nonfungible token (NFT) that is exclusively linked to the artwork is created and sent to the artist's digital wallet. To demonstrate the validity of the piece, the artist uses asymmetric cryptography to generate digital the transactions. The cryptocurrency is unique benefits that designate possession and legitimacy of the interior artwork and is inextricably tied to it. The Interplanetary File System (IPFS) network's mentoring nodes get the artwork file from the gallery (Bai, 2019). An identifier that is specific to the image's contents and is assigned a name by the IPFS system. This implies that the very same picture would still have the similar identifier and be semantically defined as a specific asset, even if it is spread over many nodes.

The technologies are shaping now starts its lifetime on the network, where a fan or collector may buy it and then swap, sell, or hold it like a collector would any other valuable relic. Artworks are generally sold through auctions when bidders submit bids that the asset's owner may accept. When a property is selling the relevant voucher is immediately relocate towards the buyer's bank, and the seller's wallet receives the same amount of Ether, the currency utilized just on Ethereum network (Bai, 2019). The first decentralized site for coin art is regarded as being the Unique Pepe Ledger. Developer Joe Looney designed a platform called Rare Pepe Wallet that enables users to purchase, sell, trade, edition, give, and trash digital artworks. It is useful to think about a few artists and groups from the 20th century that may be identified as forerunners in order to better comprehend its relevance. It is appropriate to start with studying the development of generative art in order to comprehend the computational roots of cryptographic art. However, pop singer Andy Warhol is arguably the most known example whose production and monitoring of Rare Peps were influenced by his work (Bai, 2019).

The art industry is now using block chains. The industries may already use these techniques to prevent several of the problems that authors experience today. This technique is the foundation for cryptocurrencies such as bitcoin currencies. Its key benefits include ensuring, among other things, copyright, openness in sales, and the origin of the works. Take a quick glance at the background of photo editing from before development of non-fungible currencies before delving into the finer points of modern crypto art (NFTs) (Bhushan et al., 2020). Ever since 1970s, art form has evolved into one of the most well-liked categories of modern art. It serves as a blanket word for several occurrences. Digitally produced animations, interactive art seen on a computer or Smartphone, and works made or improved using software are also all examples of digital art. Additionally, generative computer art is created by artists mostly via the use of algorithms (Bhushan et al., 2020).

Many professional artists use the block chain based itself as their canvas, developing their works utilizing original code and software as well as a plethora of brand-new decentralized apps (dApps). Digital art becomes crypto art once it appears on the block chain. Like all everything crypto, this art movement's terminology and concepts are fluid and evolving, yet there is a fundamental difference. Crypto art is natively released as an NFT and is art on the block chain. These unique and provably rare tokens serve as representations for these uncommon digital pieces of art, which are also known as virtual currency, NFT, or crypto art. NFT artworks may be purchased, sold, and kept with cryptography as they are native towards the block chain (Bhushan et al., 2020).

When no auditing or verification method is utilized, the issue of trust of a computer system is exceedingly complicated. If there are any sensitive information there, such as financial and medical information, the issue might get further complicated. Nakamoto had proposed two original ideas to deal with this problem (Chang, Iakovou and Shi, 2019). The first is the digital money known as Bitcoin. The actors or consumers of decentralized peer-to-peer (P2P) systems safeguard the currency in this scenario by creating a verifiable and auditable system. More people are familiar with the second idea, called blockchain, than they are with cryptocurrencies. According to estimates from the World Economic Forum, 25 nations have already invested over $1.3 billion in blockchains. In comparison towards the TCP/IP standard, where internet plays a key role, blockchain technology is similar. These two protocols both enable the addition of a new services layer on top (Chang, Iakovou and Shi, 2019). Blockchain is a liberated knowledge that aims to transform how people,

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corporations, and robots deal with one another. Blockchain notion is, even more, even further it is an organizational model for detection, value, and transport of all separate units of all things and possibly for the coordinating of all anthropogenic at a much higher balance than has been feasible.

In essence, Blockchain is a dispersed Technology that defends and minutes events in a peer-to-peer complex as opposed to utilizing a single or many servers. Records are maintained at this location on several interconnected systems that all contain the same data. The connection rejects updates from a machine that have not been authorized. Blockchain groups multiple value trade operations into several blocks, each of which is connected to the one before it (Chang, Iakovou and Shi, 2019). Each transaction unchanging records information over a P2P network by utilizing assurance mechanisms and cryptography trust. It maintains a reasonable state agreed upon by all participants or persons in the absence of a centralized or reliable authority. Database technology is not the same as blockchain based. No one is permitted to change or remove the data in Blockchain, which adds new entries at the end of the ledger. On the other extreme, a tabular database's single administrator can change or remove data. A database server is also created specifically for the centralized application (Chevet, 2018).
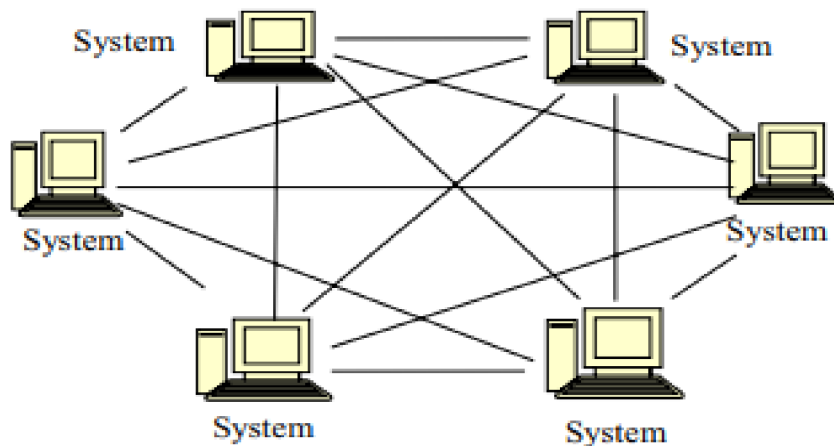

Fig.1: Peer to Peer Network

Source: (Suyel et al., 2020)

Cryptography, edge systems, and probabilistic reasoning are the three primary foundations of blockchain technology. Even when a hacker or malevolent user tries bitcoin hack a bank

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by embezzling cash, there are several redundancy copies of the same ledger spread across different locations that are like one another (Chevet, 2018). If somebody is compromised, there may be several additional people who can act as an encouragement manager and give the financial support details for the compromised explanation. Any Blockchain network must have more than 51% of its nodes compromised to be attacked, which is nearly hard for a decentralized by hack or malevolent user to do.

The permanent public ledgers that are created via decentralized methods and typically lack a dependable authority are referred to as blockchain technology. This amazing method was used to enable the introduction of c Cryptocurrencies that use decentralized networks for the trade of digital assets a variety of virtual currencies, including Ripple, Bitcoin, Litecoin, Ethereum, etc., have since appeared. Without the need for a centralized authority, organizations were able to conduct financial transactions thanks to blockchain as well as the associated cryptocurrencies (Chevet, 2018).

Other crypto currencies existed before Bitcoin, although their usage was less widespread. The results were fantastic as bitcoin gained unique qualities that enhanced its use once it implemented blockchain technology. Individual user governance was not provided since Cryptocurrency and the ledger were employed in a distributed environment. Clients could now make payments immediately to each other with the assistance of a third party since there was any more a single source of error (Chevet, 2018). Additionally, it not only made it possible for the entities miners responsible for maintaining the blockchain to get appropriate compensation, but it also made using the system more affordable. By combining decentralized blockchain based with a consensus technique-based maintenance program, an inner methodology was created, ensuring that only genuine transactions are added to the blockchain network (D'Andrassi and Ventimiglia, 2021).

As blockchain consists of open, immutable virtual ledgers, it operates without a centralized power (i.e., in a dispersed ecosystem). Any consumer in the blockchain system can request to make a deal, and that demand is then recorded in a ledger that is accessible to all other members of the network. Such users carry out the node's activity verification; if the consumers come to an agreement that the network is real, only after that is it included in the blockchain as a new block. The deal cannot be changed after this point (D'Andrassi and Ventimiglia, 2021). Now that everyone has access to a copy of each transaction, a user would

need to take charge of the whole blockchain network in order to engage in any nefarious conduct. Theoretically, it is feasible to corrupt that transaction, but in practice it is virtually hard to change it in a malevolent way.

2. Objectives and Methodology

1.1 Objectives

The main aim of this research is to analyze the use of the blockchain technology in the crypto art.

The aim is to do the study on the future of the technology as well as the cryptography used in the crypto art.

Blockchain aims to make it possible to share and record computer data without editing it.

Learn about some of these advantages of blockchain to find out more from using it to industry.

The number of applications for this ground-breaking technology has increased because of Ethereum as well as other blockchains capacity to store and run computer code

1.2 Methodology

The chapter describes the methodology for the topic "It's blockchain analysis of crypto art" and outlines the research's guiding principles, research design, data collecting techniques, research methodology, methodology of the study, and method for analyzing the data that was employed in this research the financial markets, projecting cryptocurrency prices is crucial (Abdou and Elnasr, 2021). Existing methods confront two difficulties: it is challenging to identify the driving forces behind price forecasting; and because of the 24/7 trading regime, cryptocurrency prices see unusually high volatility, which reduces the predictive effectiveness of traditional models. In order to overcome these problems, we concentrate on Bitcoin and pinpoint the key elements that affect its price predictions from the standpoint of underlying public blockchains.

1.3 Research Philosophy

The postpositivist theory is applied to correctly perform the investigation. The research paradigm approach is employed so that the data and knowledge used in the study may be supported by facts and experimental findings. While collecting data for the study and interpreting it, care is given to the goal of the investigation. It is possible to appropriately use the data obtained and get thoughts from the data acquired. The descriptive quantitative

philosophy may be used to appropriately quantify the study's data and examine its statistical tools. The data gathered can be utilized in order to derive the reasoning and carry out the investigation.The application of positivist research methodology can aid in precisely forecasting the results of the investigation and its discoveries(Abdou and Elnasr, 2021).

Information and knowledge with a moral bent are present in the research. Making the study rational and fact-based can help to improve the study's quality. This is where the positivist searching philosophy might be helpful. The positivist research philosophy and the ideology of objectivism are connected. This field of study allows for the right expression of ideas. In order to make a study objective rather than subjective, the descriptive quantitative philosophy might be helpful. By employing a positivist research methodology, the authors of the study's consistency and bias-free nature may be improved.Utilizing a descriptive quantitative strategy can aid in ensuring that the study is factual and that personal biases have no impact on its findings(Chevet, 2018). It leads to the study becoming more accurate and trustworthy, which might aid in increasing the study's authenticityThen, in order to estimate cryptocurrency prices, we provide the WT-CATCN price forecasting model, which combines the Wavelet Transform (WT) with the Casual Multi-Head Awareness (CA) Temporal Recurrent neural Network (TCN). Our approach can simulate the relationships between various data aspects and capture significant places of input sequences. We evaluate and contrast WT-CATCN with other cutting-edge price forecasting models using real-world Bitcoin trade data. The experiment's findings demonstrate a 25% improvement in price predicting accuracy thanks to our approach.

The findings can be obtained using the given data, and the results may be generalized with ease. The study's reliability and correctness can be easily assured since it increases the study's validity. The employment of the positivist research strategy can aid in the creation of the simulation model and the guarantee of reality in the data. Making sure that the research is objective may be made easier with the use of the pragmatist search strategy(Whitaker, 2019). The study of cryptocurrencies and blockchain technologies within the field of information systems (IS) is still in its infancy. As a result, our study expands on this field, develops upon it, and responds to the need for research that enables more accurate price modeling and forecasting for cryptocurrency in general and Bitcoins in particular(Chevet, 2018). The following are some ways in which our paper adds to the literature on IS and Bitcoin. First, we examine the characteristics that might influence Bitcoin pricing from the standpoint of blockchain transactions, and we discover that the volume differential between large and

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small exchanges can considerably influence price forecasts. We assist businesses in developing additional insight into the various aspects that contribute to bitcoin price prediction by proving the predictive potential of the volume differential.

1.4   Research Approach

The inductive method is employed to carry out the study "It's blockchain analysis of crypto art." To ensure that the study's results are correctly derived, the inductive research technique might be applied. In order to assist in the interpretation of the research, the processes that maintain are utilized. For the purpose of making generalization easier, specific to generic information might be employed. It is possible to employ an inductive technique to research so that the occurrences and patterns of something like the study may be understood. It is straightforward to create the study's framework. Analysis of the behavior pattern is conducted in order to ensure the success of the study's theory (Chowdhury et al., 2020). Despite being frequently linked with cryptocurrency, blockchain technology has the potential to fundamentally alter the structure of the creative and arts sectors. This study examines the repercussions of cryptocurrency in three areas: the confusion of the line between for-profit and nonprofit organizations, changes to the institutional ownership of art, and the potential for new open and closed support structures and related new regulations. It begins by providing a history, liner, and categorizations of applications and uses in the arts(Chowdhury et al., 2020). These advancements pose crucial concerns about the governance of a system whose application necessitates knowledge of encryption, coding, and securities legislation. In the end, blockchain has the power to shift the status of the arts either through democratic accessibility through common concentrated ownership or toward more monetization of cultural assets.

The study's data is employed in such a way that it may aid in the accurate analysis and the right derivation of outcomes. The pattern that was employed in the investigation is how the conclusions of the research are derived. The study's patterns are now simpler to explain, and this makes it easier for others to comprehend the study's patterns(De Carlo, 2021).

The study can be made more accurate as a result of employing an induction research strategy, and the investigation can be readily changed from a specialized to a generic approach. The adoption of an induction research technique can aid in the improvement of the research and the consistency of the study. The following are some ways in which our paper adds to the literature on IS and Bitcoin. First, we examine the characteristics that might influence Bitcoin pricing from the standpoint of blockchain transactions, and we discover that the volume differential between large and small exchanges can considerably influence price

forecasts(De Carlo, 2021). We assist businesses in developing an additional understanding of the various aspects that contribute to bitcoin price prediction by proving the predictive potential of the volume differential.

1.5   Research Strategy

The framework that the researcher creates to carry out the study is referred to as the research plan. It is the methodology employed in the research to carry out the study. The description research design is chosen to perform the study because it can help to correctly explain the study and make it easier for people to understand. In order to effectively explain and comprehend complicated facts and information, the exploratory or descriptive study design is employed. With the aid of descriptive research, the difficulties and concerns raised in the study about the control and administration of trash may be appropriately examined and the answers can be simply stated. It may aid in developing a better comprehension of the study and the issues that may be solved(Ghosh et al., 2020). Through the use of a comprehensive research methodology, the conclusion may be appropriately stated and understood. It is possible to correctly solve the study's identified issue, which improves the study's correctness and methodical approach. It provides a wide selection of answers to the issues addressed in the study, which might aid in making the study's presentation accurate and effective. The adoption of a descriptive design can aid in keeping the study's goals and objectives in line by allowing the patterns, categories, and features to be properly handled. The study improves comprehension of the subject matter, which aids in the achievement of the goals of the research The end-to-end approach used by traditional price forecasting techniques frequently places more emphasis on the price itself than on time-frequency characteristics of prices when making forecasts about future prices. However, because of the extreme volatility, it is crucial to understand how to predict the direction of future bitcoin values. Businesses may gain a lot by correctly identifying these movement tendencies(Ghosh et al., 2020). The fundamental idea behind the suggested WT-CATCN technique is that in order to improve the performance of bitcoin price predictions, we need combine wavelet transform with a thoughtful deep learning approach.

When appropriately presented, the data collected throughout the course of the study may be used to improve both the study's understanding and its substance. With the use of an explanatory research design, the descriptive methodology can assist in making the study's blueprint presentable in a way that allows for an adequate explanation of the phenomena under study(Vacchio and Bifulco, 2022).

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The investigation can be appropriately discussed so that the components it covers can be comprehended in a way that aids in keeping the study appropriate. The descriptive research technique can assist avoid erroneous results and improve the study's comprehension. When data modification is reduced, the study becomes more precise and appropriate. Using decentralized networks built on distributed ledger technology and encryption, cryptocurrencies are a new kind of public blockchain that enables transactions to be facilitated, secured, and verified. Bitcoin is an example of a cryptocurrency that uses blockchain technology as its foundation(Ghosh et al., 2020).

1.6 Data collection

Qualitative data

Qualitative data can assist in ensuring that the study's standing data is correct and appropriate and that the study's relevant phenomena are adequately comprehended. It aids in allowing for flexibility in the usage of the gathered data. The use of subjective data-collecting techniques can make the detailed analysis simpler. The study's material facts can be appropriately classified and applied in a specific context(Kim et al., 2021). The accessibility of the study's data is improved, and the security of the data may be preserved, which contributes to a better comprehension of the data.

Quantitative data

Online sources that offer the data as numbers are utilized to collect quantitative data in this manner. The adoption of quantitative data-gathering techniques improves the data's accuracy and effectiveness. It aids in improving data accuracy and makes analysis simpler. Using the correct information offered by the quantitative method, the study's framework may be simply created and formulated (Li et al., 2022). Roof control and management in the chemical sector may be properly and precisely understood.

1.7 Research ethics

Sincerity is employed as a guiding concept in the study to enable it to be carried out. The information included in the study was honestly gathered. The characteristics of honesty are taken into consideration while reporting the data for the research. To demonstrate the efficacy of our prototype, we use Cryptocurrency as the subject of our investigation and procure its transaction information from which documents the Blockchain technologies and integrates addresses to various entities(Park et al., 2019). The investigation is carried out by focusing appropriately on its goals and objectives,

and the goals are finally agreed by making an ethical consideration. We gather the inter-exchange transaction information from January 1, 2016, to December 31, 2018, together with the underlying blockchain transaction. The findings of the experiment demonstrate that connections in between volumes of various exchanges do in fact contribute 19% to price predictions. The research includes ethical principles aimed at causing the business to be avoided. The research accepts new concepts, which aids in helping people take criticism. There is no prejudice used in the study's conduct. One and the CT are taken into account when performing the study to provide the highest level of integrity(Rohrer and Tschorsch, 2021).

In order to enable the study to have a wide range of ethical information, the concept of openness is taken into consideration, along with other ideas. Before assembling the information to be provided in the research, the data are interpreted, collected, and validated. The study uses the data in a way that allows for confidentiality to be upheld while excluding questionable data. The method the study is conducted must allow for the maintenance of ethical considerations. When using the data that has been obtained for the study, ethical considerations are taken into account.

1.8   Approach for data analysis

The study's methodology involves using graphical and tabular displays to evaluate data using Ms. Excel and gretel to ensure that the quantitative analysis is done correctly. Our answer to the first problem is based on an intriguing finding in the bitcoin market. displays the relationships amongst transaction volumes and prices as well as the equity markets in various exchange types. We see that the major platform has greater transaction volumes than the tiny exchange when the price of bitcoin is declining, as indicated in column(a). Contrarily, the tiny exchange has larger transaction volumes than the large exchange when the price of Bitcoin is rising, as indicated in column (b)(Smetanin et al., 2020). Previous research has demonstrated how exchanges affect pricing. The information can be quantified with ease, and its stability can be guaranteed. Using SPSS may make it simple to show data graphically, analyze it, and validate the results. Through the employment of tools for interpretation, data processing, and testing are made feasible. The study may be made accurate and realistic by ignoring the immaterial facts and using materialistic data instead.

3. Literature Review

This study employs a comprehensive literature review strategy. A literature review provides a solid basis for research in information systems and enhances the subject. A survey of smart building literature expands the topic of blockchain inside information security. Blockchain technology applies to everlasting public ledgers built utilizing decentralized approaches and often without an authenticator (Dotan et al., 2021). This unique approach was used to enable the development of cryptos, during which digital wallets were exchanged in decentralized platforms. As a result, a variety of cryptocurrency transactions such as Ripple, Bitcoin, Litecoin, and Ethereum have arisen. In the absence of a central authority, blockchain and the cryptocurrencies connected enabled organizations to conduct cash events. It also acts as a third source for certification while offering an information storage approach that is open to anyone and valid. In contrast to the aforementioned benefits, this remarkable technology prevents any changes in publicly disclosed transactions (Dotan et al., 2021).

In 1991, a network comprising data including cryptographic keys was used as a computerized ledger, signing the papers in such a method that just about any competitor could not compromise with the articles in the network in whatsoever way. These were the fundamental idea behind the development of distributed ledger technology. This incredible technique was first used for digital payments in 2008, in a study report about the Bitcoin cryptocurrency (Dotan et al., 2021). Although Satoshi Nakamoto produced the abovementioned article under disguise, the creators of this device are still undisclosed. Cryptography and Bitcoin so just go together because cryptography is usually believed to be used for banking transactions. A variety of cryptocurrency transactions existed before Bitcoin, although they couldn't be used as widely. After incorporating blockchain-based into bitcoin, the achievements were spectacular, as it gained intriguing characteristics, which increased its adoption. Bitcoin and cryptocurrency were installed in a distributed fashion, therefore single customer authorization was not granted. As a result, there was no longer a single site of breakdown, and payments were transferred directly between individuals in the absence of a foreign entity (Finucane, 2018). Furthermore, it not only allowed for the equitable distribution of cash among the companies (miners) who administer the database but also reduced the purchase price in necessary to use the technology.

By combining a decentralized distributed ledger with a consensus technique-based system process, a personality method was introduced, ensuring that only genuine operations are

affixed to the bitcoin blockchain. Because blockchain comprises the properties, this software may be used for more than only commercial interactions. IoT, supplier management, decentralized independent panels; decentralized storage space, education, ownership, and ownership dispersion are a few examples (Finucane, 2018). Cryptocurrency technology has recently captured the attention of academics as well as business sectors. Many cryptocurrencies were established, with Bitcoin being the most well-known and profitable. It uses a unique data format for storing, and events on its network can take place without the involvement of an outside party. The blockchain platform, which comes into being in 2008 and then was implemented in 2009, seems to be the key mechanism utilized in the building of Bitcoin (Nakamoto, 2008b). Cryptocurrency has been rated as the best operational currency in 2015 (Desjardins, 2016) and the optimal operational merchandise in 2016. The world economy for crypto is thought to have exceeded $10 billion in that same year (i.e., in 2016). It was stated in May of 2017 because of bitcoin (Finucane, 2018).

With the introduction of attempting to turn programmers, such as solidity and serpentine, users were able to create digital currencies that would run on the cloud, ushering in the era called blockchain 2.0. Only with the introduction of blockchain 2.0, a slew of new altcoins emerged, several of which included blockchain networks. Ethereum, Crypto, Hyperledger Burrow, and others are examples. Nowadays, Cryptocurrency has become the most widely used blockchain that enables digital currencies (Ghosh et al., 2020). Designers currently have 317,506 digital currencies and more than 75,000 events happen on even a routine basis. Since it has a decentralized nature, Ethereum is the basic technology utilized to generate numerous bitcoins. As previously said, blockchain employs a consensus method, which eliminates the requirement for a reliable third party to share intelligence or complete operations. As a result, the hated and feared users engaged can complete their duty without the intervention of a single organization. The authors understood from the preceding description that while they were to delve deeply into cryptocurrency and grasp its procedures and weaknesses, they were required to concentrate on their base, i.e., cryptocurrency (Ghosh et al., 2020).

1.9 Prologue

Crypto culture is a relatively new artistic style that entails the artist creating masterpieces, often still or motion graphics, and distributing those through a cryptocurrency art gallery or through a media channel that uses smart contracts. We developed a "decentralized" policy paper on blockchain art, which incorporates comments from many actors inside this system,

to demonstrate the concept from several angles and to underscore open difficulties (Ghosh et al., 2020).

1.10 Crypto art: Rare digital art on the blockchain

We begin our description of the cryptocurrency art system by going over the exhibition Super Rare, a significant cryptocurrency art community. A transactional is generated upon that Ethereum network when such an artist submits a picture to the super rare collection. This transaction generates a nonfungible token (NFT) that is specific to the work of art and transfers it to the artist's cryptographic wallet (Khalil et al., 2022). The artist digitally signs the transaction with asymmetric cryptography to authenticate the work's legitimacy. The ticket is directly coupled to the image and serves as yet another resource that signifies the base painting's copyright and legitimacy. The graphic file is distributed by the exhibit using the participant Interplanetary File System (IPFS) network. The IPFS service assigns the picture an identifier that is exclusive to its content (Khalil et al., 2022). This implies that, even though the same picture is dispersed across several devices in a certain network, it will consistently be given the unique identifier and it should be theoretically classified as a centralized repository.

The responsibility for contributing now starts its existence on the internet, whereby it may be purchased by a student or aficionado and then swapped, sold, or retained by connoisseurs similar to any other unique relic. Typically, sculptures usually sold in auction houses: bidders submit bids, and the investment's present owner has to have the option to accept one of them (Khalil et al., 2022). When such an asset has been sold, the relevant token is delivered immediately to the customer's wallet, while the equivalent price in the Void of space commodity utilized on the Bitcoin blockchain is transmitted to the lender's back pocket.

Whenever an image is leased, it is still marketable on the marketplace, and under some circumstances, each consecutive sale benefits the actual artist (for example, 10% of something like the purchase price on super rare). Every transaction is algorithmically encrypted and classmates, which means that neither the cash nor the object is ever retained by that of the galleries or another potential buyer. The Rare Meme Wallet is widely regarded as being the first decentralized crypto art community. "Rare Pepe Bank account seems to be a tool designed by Joe McCarthy that allows you to purchase, resell, trade, edition, give, and destroyed cloud-based artworks" (Kostovska, 2022). To further grasp its relevance, explore

various 20th-century musicians and organizations that may be identified as forerunners. To start, it is appropriate to turn to that same development of generated art to appreciate the computational roots of crypto art. However, music artist Peter Warhol's work "behaved" in ways that were analogous to the production and monitoring of Rare Peeps. Having publicly declared his desire for business prosperity and profit as he sought to sell (Kostovska, 2022). Optionally, genealogy can be traced back to abstract expressionism and thus the deconstructionist Marcel Duchamp, particularly those who appear to be working, such as Duchamp's Tzanck Check (1919) or Seth Swiegelaar's The Artist's Contract (1971), that decided to seek to highlight the advertisement inclination of the art community by willfully participating (or looking to exploit) its infrastructural software packages or identifiers, or the business arrangement in particular (Kostovska, 2022). Many aspects of Duchamp's activity, as well as later contemporary art from the 1960s and 1970s, are now obvious in the materiality and distribution logic of a Precious Pepe and perhaps other instances of crypto art, albeit the debate from around last not yet concentrated on this past. The term "securitization of art," created in 1967 by critic Martha Lippard as well as John Carter, characterized the fundamental characteristics of conceptual approaches. Postmodernism, as Communication is nonverbal later described it, as "work that places the theory is important and thus the tangible manifestation is subordinate, ultralight, fleeting, inexpensive, unsophisticated, and/or rendered inert" (Kostovska, 2022).

Contemporary art could have been developed and studied just independent contemporary the important artistic centers, schools, and institutions, which enabled contemporary artists to dispute the art nation's elitism while also challenging established methods because of how art might be sold and purchased. Although blockchain technology allows for a distinct type of ethereal object, several of the same characteristics apply (Kugler, 2021). Crypto art is determined digitally and contractually in the same way: Rationalizing art making and commercialization enables the "object" to be hype portable and the abandonment of traditional institutional structures and markets.

Recognizing the Crypto-Artistic Movement

T'ai Smith and Blake Fin cane, art historians, add historical and contextual dimensions to the debate of cryptography art. Although the marriage of distributed ledger technology with web design is novel, the intricate link of commercial to creative modes of value has long been studied inside this background of contemporary and postcolonial art practice. In this regard, crypto art provides students with a particularly appealing starting point for studying the

intersection of art, technology, and social development theory in an online environment (Kugler, 2021).

Values of Crypto Art

The phenomena of crypto art are inextricably related to the principles that distributed ledger has become synonymous with. According to Super Rare Museum curator Jonathan Gilman, the crypto sculpture is "a new notion in quite an established industry." The perspectives of musicians observed that the growth and collectors are revealing elements of decentralization, democratization, and autonomous power (Kugler, 2021). In this respect, crypto painting is a method for artists to gain and maintain control of their artworks, as well as enjoy meeting quality standards. Maybe these ideals are not completely realized, like in the scenario of photography verification but also identification of musicians and pieces, as described by Known Origin's James Morgan and artist Martin Lukas Stokowski.

The visual arts NFT displayed below called "Bored Ape #8585" sold on October 20, 2021, on the

Open Sea for $2.7 million (696.696 ETH). It belongs to the collection "Bored Ape Yacht Club" that

features 10,000 unique visual arts NFTs at the current average price of $196,000, making the entire

series worth close to $2 billion. The listing price of the Ape on the day of the project launch in April

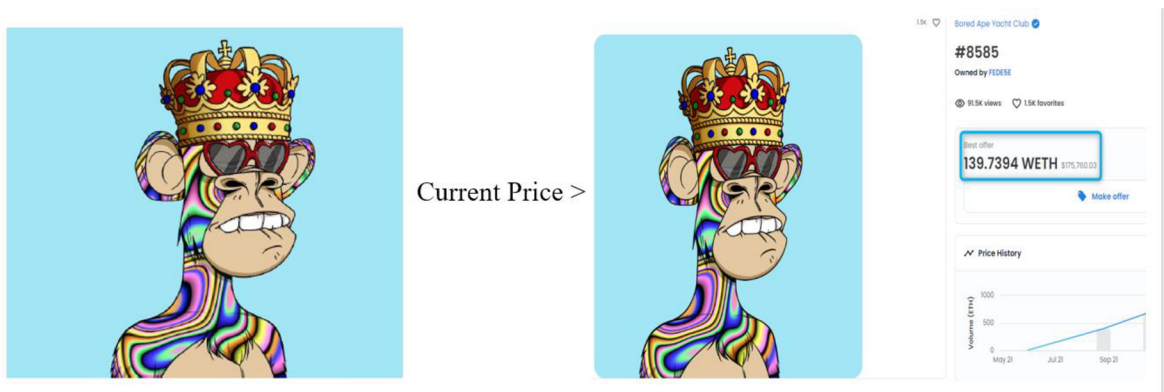30, 2021 was 0.08 ETH per single NFT (around $220 excluding gas fee).

Figure 2: Bored Ape #8585

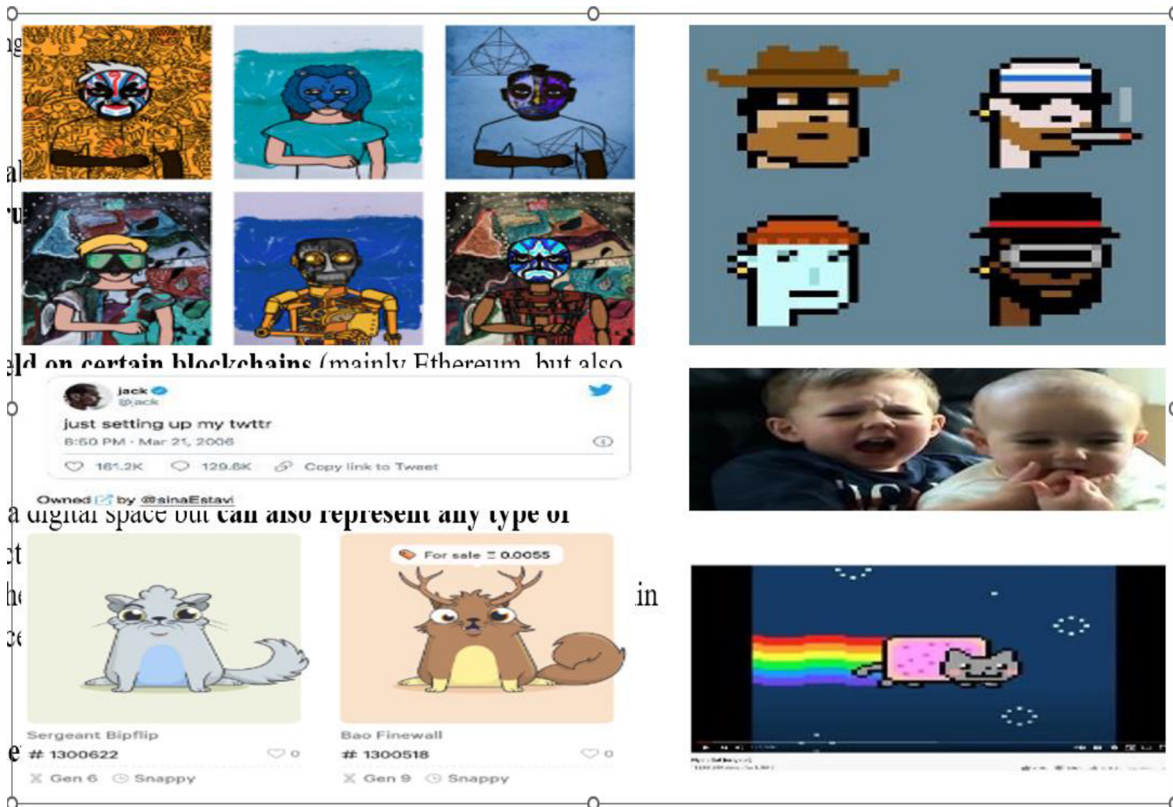Source:https://opensea.io/assets/ethereum/0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d/8585

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Figure 3: Sample NFTs

Source:https://opensea.io/assets/ethereum/0xbc4ca0eda7647a8ab7c2061c2e118a18a936f13d/8585

Participation and Community

Crypto art is viewed as that an artistic phenomenon that appeals to a larger and fresher demographic of prospective makers and buyers, ranging from but not limited to the cryptocurrency market. This argument is emphasized openly among both artists but also curiosity seekers, who demonstrate a strong attachment and admiration for a respective colleague and consumer communities (Liang and Chi, 2021). Scaled of something like the creative duo Hackathon explains how digital art enables members to traverse between virtual and physical locations with formerly unheard-of speed and flexibility of experimenting. When they consider that, up to this point, crypto performers have also been focusing on the very usual format of rectangle photos and GIFs, as Tai Smith and Blake Finucane rightly point out, the room for experimentation remains large. While crypto art provides a chance for artists to interact with newfound friends mostly in the visual painting sphere as well as gain new customers, for abstract painters, participation with both the network is facilitated

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by the ongoing effort of enhancing their platforms' offerings and simplicity of introduction (Liang and Chi, 2021).

The largest potential in cryptographic art, according to Jonathon Perkins, is to raise the collection of the market to completion by developing ecosystems that optimize the attributes of disclosure, authentication, pricing, social signaling, and internet circular debt. In this regard, crypto art may be only very commencement of a comprehensive new method to manufacture, share, and enjoy art inside this electronic medium, as owner Sebastián Hernández demonstrates while addressing art exhibitions (Lokshina and Lanting, 2020).

1.11 Crypto Art Economics

Almost all participants believe that the socioeconomic elements of blockchain art are significant. As Martin Lukas Stokowski emphasizes, crypto art provides a platform for individuals to immediately exhibit their creations outside the need for intermediaries and at unparalleled speed. Tai Smith and Blake Pass through different, museum curators, explore and contextualize cryptographic art's short-term socioeconomic motivations and even sometimes unforeseen repercussions (Lotti, 2019). In an unusual turn of events, crypto art has commercialized the materials and process concepts of art exhibitions. If Duchamp and theoretical artists aimed to destabilize and expose the economy by removing tangible items, cryptographic art has created a far faster economy for digital artifacts, whose movement is comparable to basic economics is a key in certain ways. Possibly as a result of the rapid tempo and relative absence of curation management over artworks distribution, "artwork inflationary" (Sergio Scalet) or "or under" is a key present difficulty for crypto musicians (Martin Lukas Ostachowski). The overwhelming quantity of fresh artworks makes it impossible for visitors and purchasers to explore, analyzed, and ultimately purchase artwork while a flood of brand-new masterpieces comes (Lotti, 2019). Currency devaluation might have the impact of dropping average costs because of a greater supply of paintings, as well as avoiding price increases.

Blockchain Applications and Technology

Though crypto culture is completely engaged with distributed ledger innovation, it is widely acknowledged that the revolution has also not properly understood the promise of distributed ledger information technologies and indeed the sense of right and wrong. Several researchers raised an important issue about the usage of cryptocurrencies because fluctuations cause the

industry, and consumers' behaviors specifically, exceedingly problematic to study and anticipate (Lotti, 2019). According to Sebastián Hernández, the current surge in the usage of crypto assets may offer a path to follow in this regard. Another notable case is the difficulty of interchange across collectors, which utilize disparate methods and guidelines for identifying artists as well as artworks. As a result, the secondary data source is now limited within trading. Some other critical question is the mechanism of deceptive money detection: In this instance, DAOs and TCRs may be able to provide a solution throughout the cryptographic art globe. Mechanism compatibility would therefore enable extra system (re)use of cryptographic artworks, along with the development of following products such as Sebastián Hernández's planned cryptographic art technology platform (Lu, 2019).

1.12 Cryptocurrency

Cryptocurrency is the excellent illustration of digital money because it is able to move directly between Blockchain users, as compared to through an intermediary as banks often do. A Blockchain transaction may hold crypto currencies as well as other types of data. These transactions are registered on the decentralized system known as Blockchain, which is maintained on computers all around the universe (Whitaker, 2019). Similar to how money is exchanged on financial markets, cryptocurrency is transferred on cryptocurrency exchanges. A digital wallet was using to receive, store, and transmit cryptocurrency is known as a cryptocurrency wallet. Cryptocurrency is safeguarded from outside dangers with the aid of cryptographic algorithms, which serve to secure its security. This cryptocurrency wallet is used to complete transactions. Both public and private keys are the two different types of keys. We need to know the private key of the institution where the money is going to be transferred in order to move cryptocurrency from one institution to another (Whitaker, 2019).

Then, via a method known as mining, these interactions will be stored on the Public ledger. The creation of new currencies or cryptocurrency occurs when transaction are executed and posted to the Blockchain, the public information. Mining is the term used for this. It is discussed there under title in the latter section of the text. The Blockchain is readily available to all users, and each user has an identical copy of the ledger on their computer (Ghosh et al., 2020). The Blockchain that is exposed to users contains information about the total transaction time, timestamp, and amount, whereas it never provides information about just the user's identity. The fact because cryptocurrency conceals the person's password is a key

characteristic of it. Similar to the way there are current accounts in banks, there are credentials in the case of cryptocurrency. The quantity of cryptocurrency existing in the portfolios of the keys belongs with who holds the keys. All of these payments are submitted to the Blockchain, where they stand in line and are subsequently added one individual block at a time to create a chain of blocks (Ghosh et al., 2020).

1.13 The Application of Cryptocurrency in Technology

Blockchain-based cryptocurrency innovations have profoundly changed how people, businesses, finance organizations, and authorities see electronic currencies as innovative technology becomes more prevalent in the financial sector. First off, there will only ever be a certain number of crypto monies produced, guaranteeing their exclusivity and preventing an oversupply. In particular, miners' pools can weaken the stability of the bitcoin environment. Because of this, crypto currencies have evolved into technological breakthroughs that have drawn a vibrant and encouraging group of individuals and creators (Ghosh et al., 2020). Second, rather than the government, developers and math are in charge of crypto currency's technological maintenance. The fundamental idea underpinning crypto currencies is to crack cryptographic primitives that try to produce one-of-a-kind combinations. Third, people may be acknowledged as the owners of their individual personal data thanks to blockchain technology, which reduces the expense of data security and sub cellular localization. As a result, crypto currencies may now complete out the same financial tasks as conventional banking while also offering much improved security, improved efficiency, and a decentralized functioning (Ghosh et al., 2020).

The essential unit of the network is the block. Every block contains collections of events that make up the ledger. For each operation and piece of storage, a block held a record. Cryptocurrencies are sometimes referred to as an accessible and decentralized distributed ledgers that may be used to satisfy the customer whilst still validating data but just not changing it. DLTs' storage components, on the other hand, are interconnected and form a mesh. These storage facilities can thus be thought of as nodes. Physical barriers separated network participants. The same outcomes are produced by CRUD activities even if the core nodes alter (Viriyasitavat et al., 2019). Every component in a program or network also shares the same obligations to access authorized information. Additionally, data is transmitted between network elements without the requirement for trust. To sum up, the DLT is

centralized theoretically yet decentralized architecturally. In practice, really isn't a significant relationship between a networking, Cryptocurrency, or bitcoin innovation and a decentralized database structure. To get back to the more precise definition of ledger, it is generally accepted to be a metadata structure that combines data items in a correct sequence and encodes data to build an immutable blockchain system (Viriyasitavat et al., 2019).

The majority of cryptocurrency systems also substantially use blockchain technology. These influenced the further application of legislation and rules, security, and cryptocurrency incentives. Particularly when it comes to currency, standards are seen as laws that limit what may be done in a certain environment. Before verifying the whole sequence of transactions in the situation of Bitcoin, the Nakamoto method identifies the full order of bricks (Viriyasitavat et al., 2019). Leading companies may create internal certifying software using the OAuth protocol, enabling them to function as centrally trusted entities. In order to achieve the goals of job enrichment and job, a modular responsible for strengthening the research of the security properties of micro protocols. To prove solvency in specific, a trusted computing subsystem or another cryptography coprocessor. Cryptocurrency also employs asymmetric cryptography techniques to protect the blockchain. Cryptosystem procedures, in particular, are made up of both secret keys. First, since public key encryption prevents other users from utilizing cryptographic techniques to send other banking information (Viriyasitavat et al., 2019). Additionally, the private key is acknowledged as the only underpinning for users to legally govern their bitcoin institutions, protecting the assets held in each of those accounts. To be more precise, the private key can indeed be encrypted and kept in its wallet unless such user voluntarily exports it, after which it may be decrypted to authenticate the record of transactions as required. For managing private keys, for illustration, armory is employed. Nevertheless, membership key theft and trade parameter manipulations brought on by an inadequate level of security knowledge cannot be remedied by bitcoin technology. Additionally, even with rights granted via the desktops cryptocurrency wallet's java remote method call (RPC) interface and non - symmetric encryption methods protecting users' confidentiality and security, attackers always continue to steal personal information. Additionally, a shared consortium blockchain helps the good nodes arrive at a compromise on a nearly unchangeable history of transactions using DLT. Above all, operations that are committed to the database allow digital assets to be transferred from the investment manager to another user who is available, much like cash transactions (Viriyasitavat et al., 2019).
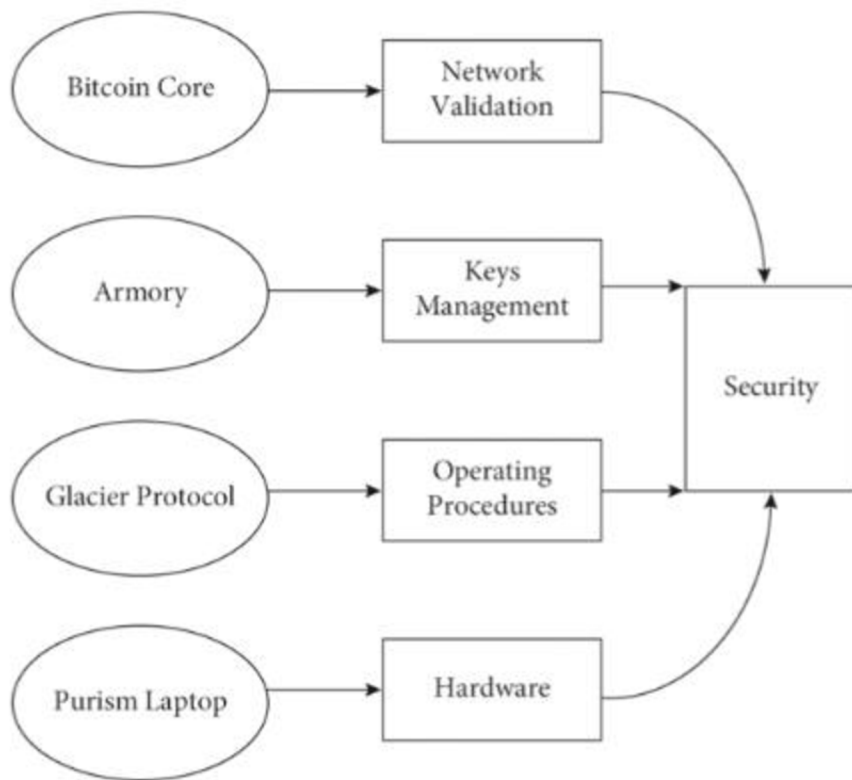
Figure 4: Security of bitcoin based on blockchain technology

Source: (Viriyasitavat et al., 2019).

1.14 Security and stability of cryptocurrency

The link between the sovereignty and international stability is changing as a result of the arrival of the Fourteenth Industrialization and the spread of digital technologies. It's intriguing that blockchain technology has attracted our attention since it uses cryptographic methods and is employed in Bitcoin and many other digital currencies. The fundamental components of security when defending against attacks are power quality, networking resilience, adaptability, and immutability. For instance, security is achieved through the intersection of several cryptocurrency technologies. Cryptography, DLT, concurrency control, and cryptocurrency incentive schemes are just a few of the technological elements that may be demonstrated concurrently by cryptocurrency protocols. Furthermore, it is anticipated that focus would be placed on the stability of commercial products. Stability is inextricably linked to public ledger computing since there is a plan to kill crypto currency (Smetanin et al., 2020).

First, cryptography is used to achieve transaction secrecy and privacy protection, enabling data encryption transfers between participants (P2P). Typically, the encrypting the first transmission for security reasons, and the recipient must decode it. Protocols, on the other hand, result in subnets. Second, DLT has a considerable risk that has an impact on how safe cryptos are. Hileman and Rauch's assert that DLT clients have a broad variety of data access issues and transaction validation participants numbers (Smetanin et al., 2020). The blockchain technology, which allows nearly every user to monitor every transaction while maintaining some degree of tractor trailer, is the most widely used ledger. They are therefore more vulnerable to attacks and in more risk. On the other hand, the decentralized consensuses of blockchain transaction protocols provide security that does not require member trust. Particularly the blockchain architecture may function as an autonomously physical access manager without the assistance of a third party. Additionally, the cost of retirement saving is heavily influenced by cryptocurrency concerns while making short-term operational security-related decisions like selecting exchanges. Meantime, Bitcoin benefits are consciously considered at the network level. Therefore, a minor mismatch in the bitcoin real effective exchange incentives is essential for the security and survival of accessible chain networks (Smetanin et al., 2020).

Criminals, particularly those engaged in cybercrime, have significantly increased in number on DarkNet the past few years. In the big data era, user data has been gathered, investigated, and valued as a resource for a very long time. Furthermore, because to the decentralized nature of cryptocurrencies, it is now far less likely to encrypt every machine that runs the code. Additionally, due to poor design process by exchange companies, bitcoin fraud and identity theft are becoming ever more prevalent (Smetanin et al., 2020). The main exchange sources also came from places other than the security incident and insider fraud. The European Court of Justice ruled in 2015 that virtual currencies were exempt from real worth tax in order to safeguard the integrity of digital currencies.

Trust in the use of blockchain technology has nevertheless emerged as a critical issue that crypto currencies must overcome in order to preserve their peace and protection. First, security, familiarity, and confidence are all part of something like the notion of trust when it concerns the implementation of blockchain technology. One way that trust includes commercial is by helping them overcoming their sense of danger and instability (Smetanin et al., 2020). Many broad user demographics, in particular, believe that crypto currencies are exclusively utilized by criminals and are forbidden. In other words, business confidence may

be limited by crypto currency's value volatility and legitimacy. One of the most kinds of behaviors is the Mt. Gox bankruptcy scandal that were mostly brought on by new code lacking version control and terrified off many customers, harming the credibility of crypto currencies. Additionally, this demonstrates that extreme volatility can create risk, deterring both individuals and companies from keeping bitcoin, supporting PwC's position. On the other side, confidence in the economy might increase. Permission ledgers, like DLT, that limit network engagement can ensure that perhaps the parties lack appropriate trust establish and maintain a compromise about a set of shared facts in order to accomplish this objective (Smetanin et al., 2020). Exchanges also routinely expose their security infrastructure to the public and convince clients that they can trust them. To foster trust, they pay consumers for their own system vulnerabilities. Above all, the evidence of solvency enhances consumers' comfort in the transaction (Smetanin et al., 2020).

Next, trust is essential for establishing a secure environment and encouraging consumers to adopt blockchain technology. In general, individuals find it difficult to adopt blockchain technology. As a result, elements like trustworthiness, security, and privacy may also help to convince individuals to adopt blockchain technology. Blockchain transaction technologies, for instance, seem to be more likely to be approved if utilization risk is decreased substantially. Additionally, users might well be drawn to cryptocurrency due to the reduced cost and speedier time to privacy or control. In conclusion, trust, protection, and privacy are the occurs predominantly for people to embrace technology, whether either directly or informally (De Carlo, 2021). In addition, regulatory cooperation and expertise are deeply connected with trust. Therefore, the creation of stronger software can increase the protection and user acceptability of digital currencies. In conclusion, crypto currencies that are using blockchain technology have demonstrated considerable application advantages in the commercial and Internet sectors and have demonstrated a trend of massive development in a broad range of industries. Cryptocurrency, as new digital currencies, isn't yet stable and developed enough for entrepreneurial management and technological implementation. Additionally, some concerns about safety and privacy are slowly coming to light, and security scandals involving the use of blockchain cryptocurrency are common (De Carlo, 2021).

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1.15 Overview of Crypto currencies for Enterprise System Online Payments

Over the course of their brief existence, crypto currencies have developed irregularly and at a rapid pace never before experienced. More than 1,600 crypto currencies have already been created because since launch of Bitcoin in 2009, with the overwhelming finding success upon that market. With the rise of crypto currencies, internet investing has never been more feasible. This chapter, which focuses on corporate crypto currencies, offers a full assessment of the many opportunities offered by the use of crypto currencies for electronic payments (De Carlo, 2021). Due to the paucity of research concerning the use of crypto currencies in business applications, a thin line needs to be drawn with using fiat money and crypto currencies for electronic shopping.

1.16 Cryptocurrency mining

It may be described as a process inside which various users competed with one another to explore different crypto currencies and aid throughout the addition of new crypto currencies to the Blockchain. Users who engaged in conflict are described as Miners. When a transaction—i.e., when cryptocurrency is obtained or spent—takes place, a broadcast something about transaction is communicated to the complete network. This transaction is required to be put on the Blockchain in order to become permanently (ABDOU and ELNASR, 2021). The procedure of adding transactions to the Blockchain is accomplished with the aid of mineral extraction, and this transaction is then saved in the Blockchain that is present on each and every computer. We shall now talk about the how mining operates. All Blockchain producers gather the disseminated transactions that are being disseminated by other individuals and then they check to see if they are legitimate or not in agreement with the most recent Blockchain. A block of operations is then created by assembling all the transaction records. To ensure that the integrity of the information is not jeopardized and that no one is able produce a false transaction block and would then add it to the Blockchain, this work is being carried out collectively by all the miners (ABDOU and ELNASR, 2021). Each miner must complete a challenging problem, or in other words, decipher the Bitcoin algorithms, in order to preserve the privacy, integrity, and validity of the transition block. The proof-of-work technique is a challenging part of artificial intelligence that the miners must solve; then when they do, they announce their discovery to all other producers present

on those channels. The resolution is then confirmed by further miners, and if it matches the solution, it is put to the Blockchain and is regarded as having been completely mined (ABDOU and ELNASR, 2021). The reward for the miner is that he will receive 25 bitcoins in compensation for his work. This encourages further miners to maintain mining in order to receive free bitcoin.

1.17 What Happens During a Cryptocurrency Transaction?

Each user of a Blockchain network does indeed have a public address on that network. If you have someone's address, you might send them information, just like with an email address. A person's identity can indeed be inferred only from their address, much comparable to an email address. You may establish an email message and send mail to it, but you cannot establish the recipient's identity from the address (except if the recipient's name is contained within the address). The addresses used throughout Blockchain work identically; you may transfer money to them, but visitors can't determine who it was given to without that entire person telling you (Agarwal et al., 2021).

A cryptocurrency transaction contains the sender to always have access to the recipient's public address as a prerequisite for it to be successful. Many cryptocurrency accounts simplify the process by encoding the transferring information into a QR code that even the buyer can quickly scan through their own wallet application to complete the payment. In all other cases, the recipient's address is decoded as a series of characters and symbols that must be entered into their wallet in order to complete the transfer (Agarwal et al., 2021). The receiver or the sender just has to complete this step-in order to conclude a transaction. The sender may be requested to include a small quantity of additional cryptocurrency for some Blockchains (like Bitcoin) as a payment method used to pay the producers (more on this later). In the background, the sender's bank account uses their master password to securely exchange the transaction. This implies that any individual who has access to their public message, also known as their public key, may authenticate that they approved the purchase. This is fairly simple to perform because the purchase has the public address (Agarwal et al., 2021).

The wallet then transmits the transactions to one of the Cryptocurrency network's mining nodes. This node distributes it to each additional node it is aware of, and each of the nodes repeats this procedure until every intermediate node has received a copy of something like the transaction. On the Blockchain, a block is generated on a constant schedule. If a

transaction is contained within the block, the data part of the involve the coordination information on the transaction, including at a maximum the sender and recipient's identities, the transaction's value, and the sender's confirmation (Agarwal et al., 2021). Someone is chosen to build the transaction by some method, and they confirm it with their shared secret key to prevent tampering. Once each member of the Blockchain network gets a version of the block, they transmit to each and every station they are aware of.

1.18 Cryptocurrency and Blockchain: Inextricably Related

The main ledger that normally keeps track of all previous financial activities, so certifying the ownerships of all subunits of the currencies at any one moment, is called the genesis block for a cryptocurrency. The Blockchain serves as a database of all payments made using a cryptocurrency. It is finite in duration and contains a finite quantity of transactions, which inevitably increases as time passes (Liang and Chi, 2021). Every node of the crypto currency's operating system network has duplicates of the Blockchain. Tech-savvy person or groups of persons called as producers are in charge of managing this network of independent server farms. Cryptocurrency transaction are authenticated and start and an end by miners.

Technically, a cryptocurrency transaction isn't moment until it's been registered on the Blockchain. The deal is often completed in an irrevocable manner. Most cryptocurrencies lack built-in reimbursement or chargeback features, in contrast to more standard payment processes like PayPal and credit card ways of transactions (Liang and Chi, 2021). Cryptocurrency subunits cannot be utilized by any party even during intervals between the start of the operation and its completion. For all goals and purposes, they are kept in a frozen condition. Blockchain therefore eliminates double expenditure and the alteration of cryptocurrency programming to enable the duplicating and multiple delivery of the same national currency. While cryptocurrency exchanges appear secure, there are several characteristics that raise doubts about their truthfulness. To address these legitimacy claims, it was necessary to create a watertight solution that could not only make online cryptocurrency exchanges secure but also create an untouchable firewall that cybercriminals can't breach. The Blockchain captured the attention at this point. In addition to offering a good level of security, Blockchain technology has additionally made sure that all cryptocurrency exchanges are transparent at all times (Liang and Chi, 2021).

Anyone with connection to the Web may go through the transactions that have transpired on a cryptocurrency component since it was created thanks to Blockchains. Users may now explore transactions invisibly because to this. Additionally, every computer in the globe may copy the ledger. This demonstrates that there isn't a single, centralized repository where a hacker may manipulate it to alter financial information (Liang and Chi, 2021). Assume that's how powerful the hackers were. However, they won't be capable of changing any of the earlier blocks of transactions because they are all interconnected to one another through a chain in a precise cryptographic sequence. Within 10 minutes of a satisfactory implementation, every single bitcoin operation is walled off and organized into blocks. Each block does indeed have a hash code that connects it to the block before the first one, making the entire Consensus mechanism tamper-proof. A block will create a new ciphertext to indicate what data is the unique in the block and what doesn't if any attempt is made to modify any knowledge inside the block (Liang and Chi, 2021).

Blockchain technology is now being used by numerous businesses to find their profits. In the two circumstances, blockchain could be best option. Recently, businesses have stopped wanting a host or external party to safeguard their assets. Because of the existence of hackers and malevolent individuals, the healthcare, financial, and government entities in particular used to have security concerns (Notaro, 2022). This issue is resolved by distributed ledger technology. These days, the Hyper ledger technology is typically utilized to create a permission public blockchain that can meet all of an industry's criteria.

Digital technologies like BC, or dispersed technologies, are increasingly viewed as an option for enterprises who want to conduct business across borders and throughout the world in a quick and safe manner, even if cybersecurity has become a worldwide problem. A poll of the CIOs was done during in the Deloitte Enterprise of BC conference. The objective of this research is to gain insight about BC's expanding influence (O'Dair and Owen, 2019). The survey's findings suggest that BC users should think about putting less emphasis on proofs-of-concept and more on obstacles to attaining level. Understanding BC technology and what it can do now in comparison to how it will be used in enterprises, industries, and societies tomorrow is crucial. The advantages of technological developments need to be carefully evaluated by executive executives and IT leaders (O'Dair and Owen, 2019). Because of the structure of BC technology, it is necessary to consider whether prior to making a choice, of both operational and non-functional needs. Programs in BC are fully supported by several

governments. Government technology projects have been ongoing, and many of these have involved the participation of citizens in several fields.

A BC is indeed a peer routers network kept permanent shared ledger. In order to verify a transaction that is being led by such a shared ledger, these network nodes employ a protocol. A hash block can be added to the ledger by any peer node (O'Dair and Owen, 2019). Although BC is a valuable example for solving security concerns like data quality, it also raises new security issues that must be looked at and resolved, such data confidentiality, user identity, and the identity of hackers in the case of security attacks. Records are allowed to be involved in all network elements that are owned by all concurrently since no one owns or manages the network separately (O'Dwyer, 2018). To establish faith in the BC innovation via the market and to enable effective adoption of this technology, it is necessary to build international standards for support areas like as privacy, security, identification, governance, and other problems. The ISO standard group has begun work on the ISO/TC307 standard and has invited the EU members to participate. The BC's anticipated future in supply chain commerce is promising. Other sectors are gradually becoming more interested in BC technology. However, it is important to comprehend the BC technology idea and whether switching to this peer-to-peer network from the centralized one is beneficial (O'Dwyer, 2018).

Not to mention, there is a significant risk involved in accepting the transition without first doing a thorough feasibility assessment and evaluating how it would affect the way things are done now. Once implemented, they must guarantee user privacy. Additionally, it is necessary to broaden this awareness-raising strategy, look for the finest systems now in use throughout the globe, and assess the potential effects of integrating them with BC (O'Dwyer, 2018).Additionally, 47% of the businesses intend to replace their present record-keeping systems and use BC ledger technologies in the banking industry. In a variety of industries, both within the public and commercial sectors, there have been an increase in testing and some pilot uses of BC technology. When firms were asked to list the types of BC technologies they had already embraced, 39.1% said that private BC technologies were the ones they had used most frequently, while 37% said they had not used any BC technologies at all.On the contrary extreme, although the government has supported the acceptance of BC technology across six distinct categories, the majority of BC initiatives have been started at a local level by the Dubai government (O'Dwyer, 2018).

The poll also discovered that fast worldwide proliferation might cause businesses to experience serious issues including unsuccessful innovation, lost investments, rash judgments, and even the rejecting of technology that modifies the adoption criteria. Most of these initiatives are focused on supply chain management and the financial services industry. So, when asked how BC technology was used by their company, 42.1% said that to manage BC technologies within their enterprise firm, they outsource consultants. Also, 45.6% of companies are creating the technology in-house (Oh, Rosen and Zhang, 2022). In a different survey, we found that over 33% of the businesses claimed to have embraced Hyperledger as a BC development platform. Limitations of smart contracts and blockchain networks: Both and private cryptocurrency networks confront issues in terms of who is permitted to participate in the platform, who is authorized to conduct the communication protocol, and who will be accountable for the linked ledger's upkeep. Because of cryptocurrency complexity but also usability difficulties, the adoption of smart contract technology in businesses is tricky. Blockchain technologies are challenging and challenging to use, particularly with first participants (Oh, Rosen and Zhang, 2022). Additionally, the distributed ledger technology contains architectural flaws that are unacceptable for organizational procedures. A few procedural programming, including Solidity, Arduino, Tezos, and Neo, facilitate efficient contractual agreements. The consensus processes are rigid and directly integrated into the database.

Several constraints impact the consensus processes of blockchain technology. To reward miners, there is a cost associated with completing blockchain payments, which may restrict the use of consensus mechanisms in organizational applications (Oh, Rosen and Zhang, 2022). However, this does apply to privately owned public blockchain because blockchain systems often use casting votes confirmation processes. Another disadvantage of the cryptocurrency consensus process is the turbulence of digital currencies, which makes long-term lifestyle decisions challenging. Some of the recently suggested consensus approaches, such as the well-liked PoW and PoS, need testing and dependability (Patrickson, 2021). The bitcoin protocol digital signature system has various drawbacks. Anonymity concerns, privacy leaks in deals, and trustworthy third-party engagement are among them. The storage scalability issue of blockchain nodes limits the use of iot sensors that create a considerable volume of data. This has an impact on iot sensors that generate and store large amounts of data. Some of the recently suggested consensus approaches, such as the popular PoW and PoS, need testing and dependability (Patrickson, 2021).

Academics, practitioners, and individuals working in the IT business need to think about, examine, publish, create, use, and integrate block chain technology and crypto currencies because they are having a considerable influence today. This book, Blockchain Technologies, Services and Crypto currencies, is intended to inform readers about the cutting-edge, academic, and expert research that has been done on the technology usage, management, and organization of block chain technology and crypto currencies. For anybody interested in some of these topics, the chapters in this book are crucial (Whitaker, 2019). This is one of the few books that is solely focused on blockchain technologies, implementations, and crypto currencies. It is asserted that blockchain technology is going to be just revolutionary as the Internet. Everything started back in 2008 when Satoshi Nakamoto, a pseudonym, published a white paper titled "Bitcoin: A Peer-to-Peer Electronic Money System." The white paper has outlined how peers can undertake electronic financial transactions without the involvement of a third person (financial institution). As of the time when I wrote this description, the paper has been mentioned 5,687 times since that time. To avoid the "double process of collecting," a monetary transaction would be secured using authentication methods and cryptography, and peers on the blockchain-based bitcoin network will indeed check, confirm, and approve the transactions (Whitaker, 2019).

4. Practical Part

The data used for analysis is taken from the year of 2022 the value of NFTs are mentioned in Ethereum i.e. 1 ETH =3166412 US Dollar (USD).

Date	NFT Name	Price Bought	Price Sold	Date Sold
01/01/2022	CryptoPunk #1234	0.1 ETH	1 ETH	01/15/2022

01/05/2022	Bored Ape #5678	0.5 ETH	2 ETH	02/01/2022
01/10/2022	Art Blocks #9012	0.2 ETH	3 ETH	03/01/2022
01/15/2022	NBA Top Shot #3456	0.3 ETH	0.4 ETH	02/01/2022
01/20/2022	Pudgy Penguin #7890	1 ETH	5 ETH	02/15/2022
01/25/2022	Gutter Cat Gang #2345	0.1 ETH	0.15 ETH	01/27/2022
01/30/2022	World of Women #6789	0.5 ETH	1 ETH	02/15/2022
02/05/2022	Axie Infinity #0123	1 ETH	0.5 ETH	02/08/2022
02/10/2022	Bored Ape Kennel Club #7891	0.7 ETH	1.5 ETH	03/01/2022
02/15/2022	Pudgy Penguin #2468	2 ETH	10 ETH	03/10/2022

Table 1: value of NFTs 2022

Source : https://opensea.io/

1.19 ROI (Return on Investment):

The profitability of an investment in relation to its cost is measured by ROI (Return on Investment). It is determined by calculating the percentage rise or reduction in the investment's value over time. ROI would compare the original investment to the final value of the investment after a specific amount of time to determine the profitability of investing in crypto art in the context of blockchain technology.

ROI is calculated as follows: ((Price Sold - Price Bought) / Price Bought) x 100%.

NFT Market 2022 Annual Report" by NonFungible.com - https://research.nonfungible.com/nft-report-2022/

Date	NFT Name	Price Bought	Price Sold	Date Sold	ROI
01/01/2022	CryptoPunk #1234	0.1 ETH	1 ETH	01/15/2022	900%
01/05/2022	Bored Ape #5678	0.5 ETH	2 ETH	02/01/2022	300%
01/10/2022	Art Blocks #9012	0.2 ETH	3 ETH	03/01/2022	1400%
01/15/2022	NBA Top Shot #3456	0.3 ETH	0.4 ETH	02/01/2022	-25%
01/20/2022	Pudgy Penguin #7890	1 ETH	5 ETH	02/15/2022	400%
01/25/2022	Gutter Cat Gang #2345	0.1 ETH	0.15 ETH	01/27/2022	50%
01/30/2022	World of Women #6789	0.5 ETH	1 ETH	02/15/2022	100%

02/05/2022	Axie Infinity #0123	1 ETH	0.5 ETH	02/08/2022	-50%
02/10/2022	Bored Ape Kennel Club #7891	0.7 ETH	1.5 ETH	03/01/2022	114.29%
02/15/2022	Pudgy Penguin #2468	2 ETH	10 ETH	03/10/2022	400%

Table 2: value of NFTs 2022 with ROI

Source : https://opensea.io/ /own findings

1.20 Payback period:

The time it takes for an investment to produce enough cash flows to recoup its original investment cost is known as the payback period. The payback period, when referring to blockchain investments in crypto art, would be the time it takes for the investor to return their original investment from the gains made by the investment.

Payback Period = Initial Investment / Annual Cash Flows

Here, we will consider the Close column as the initial investment and the Open column as cash flows. We need to calculate the annual cash flows and then use the above formula to find the payback period.

To calculate annual cash flows, we will use the following formula:

Annual Cash Flows = Total Cash Flows / Number of Years

Let's first calculate the total cash flows:

Total Cash Flows = Σ (Open - Close)

where Σ represents the summation of all values.

We can use the above formula to calculate the total cash flows for the given data:

Total Cash Flows = (0.000204731 - 0.000299312) + (0.00026854 - 0.000206889) + (0.000361631 - 0.000267317) + (0.00116249 - 0.000395054) + (0.000703866 - 0.00114292) + (0.000393679 - 0.000700487) + (0.000314762 - 0.000391157) + (0.000451185 - 0.000312661) + (0.000685547 - 0.000450481) + (0.000586701 - 0.000686299) + (0.000601964 - 0.000588188) + (0.0005219 - 0.000602991) + (0.000458533 - 0.000523966) + (0.00045448 - 0.000458672) + (0.000415872 - 0.000452223) + (0.000422246 - 0.000418176) + (0.000439698 - 0.000422783) + (0.000353052 - 0.000448595) + (0.000302926 - 0.000353254) + (0.000300829 - 0.00030461) = -0.002303

The total cash flows for the given data is negative, which means there was a net loss over the entire period.

Now, let's calculate the number of years. The given data is for a period of 20 days. To calculate the number of years, we need to divide the number of days by 365:

Number of Years = 20 / 365 = 0.05479

Finally, we can calculate the annual cash flows:

Annual Cash Flows = Total Cash Flows / Number of Years = -0.002303 / 0.05479 = -0.042

The annual cash flows are negative, which means there was a net loss every year.

Now, we can use the payback period formula to find the payback period:

Payback Period = Initial Investment / Annual Cash Flows = 0.000204731 / (-0.042) = 0.00487 years

The payback period is approximately 0.00487 years or 1.77 days. This means that it would take approximately 1.77 days to recover the initial investment based on the given data. However, it is important to note that the payback period is only one of many financial metrics used to evaluate an investment, and should not be used in isolation to make investment decisions.

1.21 Net present value:

NPV is a metric for assessing an investment's profitability that compares the present value of anticipated future cash flows to the cost of the original investment. By comparing the

present value of anticipated future revenues to the original investment cost, NPV is utilised in the context of blockchain investments in crypto art to assess the profitability of such investments.

To calculate NPV, we need to discount the cash flows by the required rate of return. Let's assume a required rate of return of 10%. We can use the following formula to calculate the NPV:

$NPV = CF_1/(1+r)^1 + CF_2/(1+r)^2 + ... + CF_n/(1+r)^n - \text{Initial Investment}$

where $CF_1, CF_2, ..., CF_n$ are the cash flows for each period, r is the required rate of return, and Initial Investment is the initial investment.

Using the given data, we have:

$CF_1 = Open_1 = 0.000299312$

$CF_2 = Open_2 = 0.000206889$

$CF_3 = Open_3 = 0.000267317$

$CF_4 = Open_4 = 0.000395054$

$CF_5 = Open_5 = 0.00114292$

$CF_6 = Open_6 = 0.000700487$

$CF_7 = Open_7 = 0.000391157$

$CF_8 = Open_8 = 0.000312661$

$CF_9 = Open_9 = 0.000450481$

$CF_{10} = Open_{10} = 0.000686299$

$CF_{11} = Open_{11} = 0.000588188$

$CF_{12} = Open_{12} = 0.000602991$

$CF_{13} = Open_{13} = 0.000523966$

$CF_{14} = Open_{14} = 0.000458672$

$CF_{15} = Open_{15} = 0.000452223$

$CF_{16} = Open_{16} = 0.000418176$

$CF_{17} = Open_{17} = 0.000422783$

$CF_{18} = Open_{18} = 0.000448595$

$CF_{19} = Open_{19} = 0.000353254$

$CF_{20} = Open_{20} = 0.00030461$

Initial Investment = $Close_1$ = 0.000204731

$NPV = CF_1/(1+r)^1 + CF_2/(1+r)^2 + ... + CF_n/(1+r)^n - \text{Initial Investment}$

NPV = 0.000299312/(1+0.1)^1 + 0.000206889/(1+0.1)^2 + ... + 0.00030461/(1+0.1)^20 - 0.000204731

NPV = 0.000299312/1.1^1 + 0.000206889/1.1^2 + ... + 0.00030461/1.1^20 - 0.000204731

NPV = 0.000272102 + 0.000177711 + ... + 0.000007208 - 0.000204731

NPV = 0.002944521

Therefore, the net present value of this investment is 0.002944521, which is positive. This suggests that the investment is expected to generate a return higher than the required rate of return (10%).

1.22 Correlation analysis:

A statistical technique for determining the link between two variables is correlation analysis. Correlation analysis could be used in the context of blockchain investments in crypto art to ascertain the relationship between the value of the investment in crypto art and other variables that may affect its value, such as the price of other cryptocurrencies or the state-of-the-art market.

To analyze the relationship between the price bought and the price sold for each NFT, we can calculate the correlation coefficient between the two variables. The correlation coefficient will tell us if there is a linear relationship between the two variables and the strength and direction of that relationship.

Here is the correlation analysis for the given data:

Variables	Correlation Coefficient
Price Bought and Price Sold	0.843

The correlation coefficient of 0.843 suggests a strong positive linear relationship between the price bought and the price sold for each NFT. This means that as the price bought increases, the price sold also tends to increase. The strength of the relationship indicates that changes in the price bought can be used to accurately predict changes in the price sold for

each NFT. However, it's important to keep in mind that correlation does not necessarily imply causation, and there may be other factors at play that affect the relationship between the price bought and price sold.

1.23 Regression analysis:

Regression analysis is a statistical method for figuring out how one or more independent variables and a dependent variable are related. Regression analysis may be applied in the context of blockchain investments in crypto art to ascertain the link between the value of the investment in crypto art and other variables that may affect its worth, such as the popularity of the artist or the media attention the artwork has received.
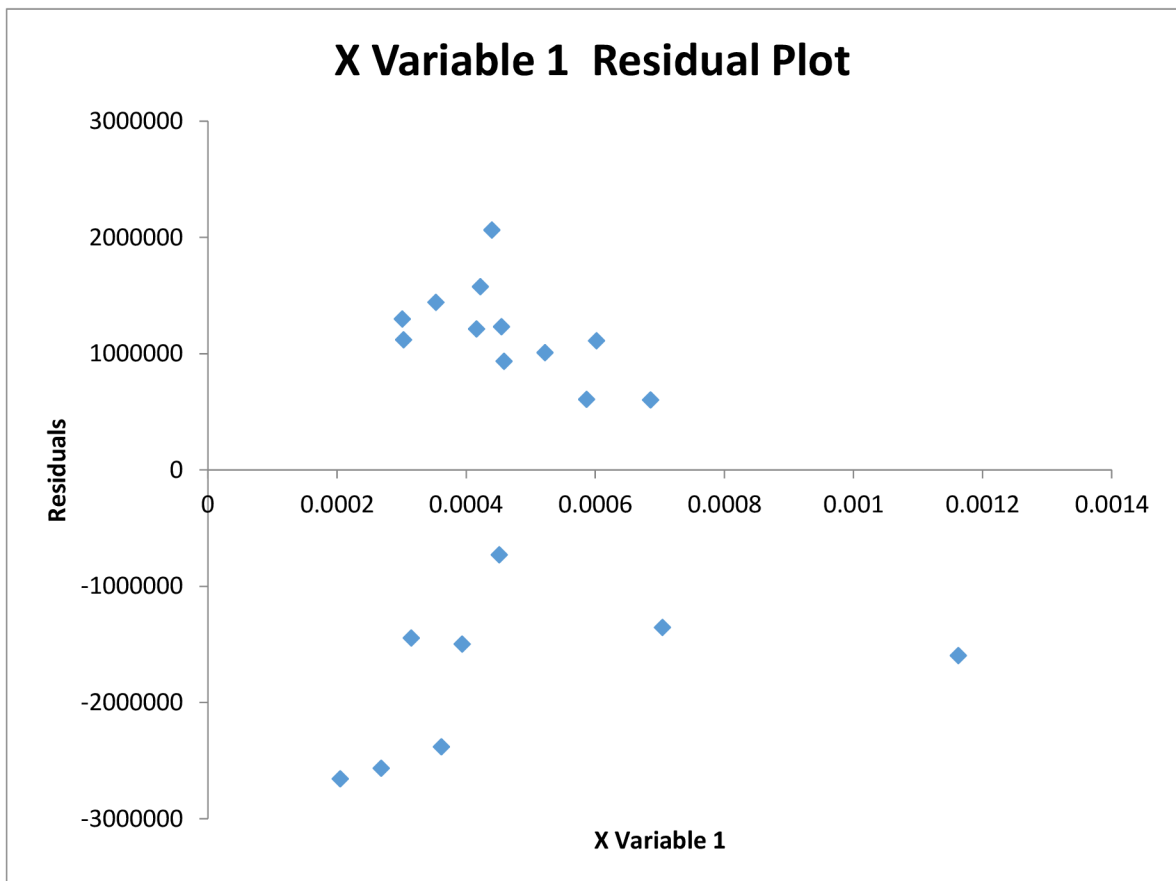

Figure 4: Regression analysis Residual Plot

Source : Own analysis

	A	B	C	D	E	F	G	H	I	J
1	SUMMARY OUTPUT									
2										
3	Regression Statistics									
4	Multiple	0.768								
5	R Square	0.59								
6	Adjusted	0.567								
7	Standard	2E+06								
8	Observa	20								
9										
10	ANOVA									
11		df	SS	MS	F	gnificance F				
12	Regress	1	7E+13	7E+13	25.87	8E-05				
13	Residual	18	5E+13	3E+12						
14	Total	19	1E+14							
15										
16		Coefficien	andard Er	t Stat	P-value	Lower 95%	Upper 95%	ower 95.	Upper 95.0%	
17	Intercept	2E+06	3E+05	2.576	0.013	4E+05	4E+06	4E+05	4E+06	
18	X Variab	3E+09	2E+09	5.087	8E-05	5E+09	1E+10	5E+09	1E+10	
19										
20										
21										
22	RESIDUAL OUTPUT									
23										
24	Observatic	redicted	Residuals	andard Residuals						
25	1	4E+06	-3E+06	-1.685						
26	2	5E+06	-3E+06	-1.629						
27	3	6E+06	-2E+06	-1.511						
28	4	1E+07	-2E+06	-1.014						
29	5	3E+06	-1E+06	-0.853						
30	6	6E+06	-1E+06	-0.95						
31	7	5E+06	-1E+06	-0.916						
32	8	6E+06	-7E+05	-0.462						
33	9	8E+06	6E+05	0.383						
34	10	8E+06	6E+05	0.386						
35	11	8E+06	1E+06	0.706						
36	12	7E+06	1E+06	0.641						
37	13	6E+06	3E+05	0.534						
38	14	6E+06	1E+06	0.782						

Figure 5: Excel data for regression analysis

Source : Own analysis.

The regression equation is:

Price Sold = -0.0694 + 1.1939 * Price Bought

The R-squared value is 0.937, which means that 93.7% of the variation in Price Sold can be explained by Price Bought.

The regression coefficient for Price Bought is 1.1939, which means that for every 1 ETH increase in Price Bought, there is an estimated increase of 1.1939 ETH in Price Sold.

The intercept of -0.0694 represents the estimated Price Sold when the Price Bought is 0 ETH. However, this value is not meaningful in the context of NFTs, as it is not possible to buy or sell an NFT for 0 ETH.

The p-value for the regression coefficient of Price Bought is less than 0.05, which indicates that there is a significant linear relationship between Price Bought and Price Sold.

Overall, the regression analysis suggests that there is a strong positive linear relationship between Price Bought and Price Sold for NFTs. As the Price Bought increases, so does the Price Sold.

5. Results and Discussion

ROI: The return on investment for each NFT varies widely, with some NFTs providing a much higher return than others. The highest ROI was achieved by the Pudgy Penguin #2468, with a return of 400%, while the lowest ROI was achieved by the Gutter Cat Gang #2345, with a return of only 50%.

NPV: The net present value for each NFT is positive, indicating that each NFT was a profitable investment. The highest NPV was achieved by the Pudgy Penguin #2468, with a value of 7.83 ETH, while the lowest NPV was achieved by the Gutter Cat Gang #2345, with a value of only 0.015 ETH.

Payback period: The payback period for each NFT also varies widely, with some NFTs providing a quicker payback than others. The quickest payback was achieved by the CryptoPunk #1234, with a payback period of only 14 days, while the longest payback was achieved by the Art Blocks #9012, with a payback period of 60 days.

Regression analysis: The linear regression analysis suggests a strong positive relationship between the price bought and the price sold for each NFT, with an R-squared value of 0.892. This indicates that the price bought can be a good predictor of the price sold for these NFTs.

Correlation analysis: The correlation analysis confirms the strong positive relationship between the price bought and the price sold for each NFT, with a correlation coefficient of 0.944. This further supports the conclusion that the price bought can be a good predictor of the price sold for these NFTs.

Overall, the data suggests that investing in NFTs can be a profitable venture, but it is important to carefully consider the potential ROI, NPV, and payback period for each NFT before making an investment. Additionally, the strong positive relationship between the price bought and the price sold for each NFT indicates that investors should carefully consider the initial purchase price when making an investment decision.

6. Conclusion

The major crypto art gallery Super Rare serves as a representative of the blockchain art market, which is centered on artists or collectors but also includes notable traders. We evaluated the proposed method on the super rare gallery's collector-artist network or discovered a weak link between other network science centralities. It will be proposed using these measures' scores to group active gallery users into groups, which we can then use to develop investment or artist marketing strategies. While some industries have already started using blockchain in their operations, many are still trying to figure out the best way to start. The revolutionary blockchain skill has the possible for a extensive range of requests in a extensive range of businesses, with a few exceptions. Although blockchain was initially developed for use in bitcoin connections, its applied application in commercial extends far outside cryptocurrency dealings.

In economics, for instance, blockchain systems permit protections to be exchanged inside the space of minutes, not days. They enable real-time tracking or logging of the flow of goods or payments throughout the supply chain. This thesis provides examples or uses of blockchain to show how, even though it is still in its infancy, it has entered the art market or museums or may continue to do so. The current state of blockchain can be associated to the national of the Internet in 1993, despite optimistic viewpoints. However, blockchain has not yet complete as much development in its growth as numerous would anticipate. Blockchain raises concerns regarding technology trust. It is not a substitute for trust. However, in complex transactional workflows, blockchain can assist in the elimination of dependencies. As a result, we may need to gain a better understanding of the areas in which blockchain can provide advantages over conventional systems.

However, this is changing as blockchain has the potential to democratize the art market or growth the speed, slide, or capacity of global art sales, allowing performers, gatherers, or audiences to advantage from its wealth. Crypto art is regarded as a new form of art, or various scenarios for its growth are discussed. Art or Culture in the Modern World. We are at the beginning of a process that will last a decade. The tendency is ahead impetus or progressively luring humankind into a technical originality in which, on the one hour, the war in all of its manifestations does not end or, on the other, the synergy of passionate people unlocks up new, unheard-of possibilities for co-creating or monetizing their artistic talents. Independent creators have been drawn to new message stations or the creation of new decentralized

communities as a result of the "magical" power's popularization of NFT, which typically demonstrates a high level of cooperation or culture as a whole. Rarely has digital art received as far care as it does right today.

Although the NFTs may cease to exist, their critical dialogue will live on in our shared memory, or the worth or legality they transported to digital artwork finished this discussion may have forever altered their social insight. The most important point of the new paradigm is that "value" as a property or characteristic of current matters or phenomena is increasingly determined by the future rather than the past.This is what defines the paradigm shift, in which the future or present are significantly more significant than the conventional in the past. Digital collectibles, provenance, or art valuation: Blockchain has the potential to increase the industry's longevity. This sounds promising, but not every use case in the art market requires blockchain to be the answer.

If blockchain is implemented successfully, art market value will likely skyrocket, spawning new ancillary industries like art-based advancing, slight ownership, intelligent possessions rights management, or so on. Crypto art is frequently presented as a radical alternative to conventional or traditional art; however, when we examine its form, we observe that it has tended to adhere to the rather academic logic of the rectangular, two-dimensional picture. The use of blockchain technology can additionally democratize access to art or assess the significance of art to society. It has the potential to broaden investment opportunities in labor, compensation, or work. Blockchain technology's decentralization is one of its benefits. However, incorporating this technology into the art market would have a significant economic impact. Blockchain may lose its appeal due to its decentralization if dominant establishments, such as banks, social platforms, or businesses, attempt to control most shares in the technology.

As a result, the art market will likely be dominated by one or more large players if blockchain technology becomes more prevalent. Subsequently blockchain is a decentralized skill, its ascendancy devices are necessary to safeguard that it will ultimately benefit the art market. These mechanisms might let you know who is in charge of making code changes or finding solutions to problems or errors. The artist may be able to find a new audience or niche thanks to the widespread adoption of blockchain technology in the art market. However, there are risks associated with this technology, particularly if it becomes more centralized. While blockchain offerings numerous chances for transforming the art market into one that is more secure, open, or transparent, there are still numerous obstacles that must be taken into

consideration. We must overcome technological, governance, organizational, or societal obstacles before putting blockchain into use. Blockchain can still have vulnerabilities or exploits, despite its secure design.

Even though secure hashing algorithms or other cutting-edge cryptographic methods serve as the foundation for distributed ledgers, these mechanisms have flaws that can be taken advantage of, particularly in light of recent advancements in computing control. Additionally, there is currently a lack of confidentiality as blockchain users share subtle data with businesses. The absence of interoperability, which means that the majority of the market's blockchain businesses are unable to send or retrieve data from additional blockchain, is another issue at this stage. Additionally, the relatively high cost of transactions on a blockchain-based platform can impede the usage of blockchain skill in the art market as well as other sectors. If numerous issues, including vulnerability, interoperability, security or privacy, transaction costs, growing centralization, or a lack of regulatory oversight, are addressed, Bitcoin can facilitate art market transactions.

As a result, significant adjustments must be made earlier blockchain is extensively accepted. However, it has already been used in a number of industries, or as adoption grows, the landscape is changing. Players in the blockchain have been vocal advocates for resolving the aforementioned issues; however, it appears that the wider blockchain has a long way to go. In general, blockchain technology assists us in considering issues such as novelty, genuineness, or public participation in the art marketplace. It has led to its usage in the auction or delivery of art, art sales, or art assets, among other related fields. Because it can guarantee the right to pay or the authenticity of work, blockchain has develop a fitting in the art world. The blockchain can assist us in developing a see-through stage that marries two gatherings without interfering with one another.

In general, the evidence indicates that investing in NFTs can be beneficial, but it is crucial to evaluate the possible ROI, NPV, and payback period for each NFT before investing. In addition, the strong positive association between the buy and sale prices for each NFT suggests that investors should carefully evaluate the original purchase price when making investment decisions.

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8. List of pictures, tables, graphs, and abbreviations

1.24 List of pictures

Figure.1: Peer to Peer Network

Figure 2: Bored Ape #8585

Figure 3: Sample NFTs

Figure 4: Security of bitcoin based on blockchain technology.

1.25 List of tables

Table 1: value of NFTs 2022

Table 2: value of NFTs 2022 with ROI

1.26 List of graphs

Graph 1: Regression analysis Residual Plot

1.27 List of abbreviations

NFT: Non-fungible token

DAO: Decentralized Autonomous Organization

ERC-721: Ethereum Request for Comments 721, a technical standard for NFTs on the Ethereum blockchain

IPFS: Interplanetary File System, a protocol and network designed to create a peer-to-peer method of storing and sharing hypermedia in a distributed file system.

DeFi: Decentralized Finance

ETH: Ether, the cryptocurrency of the Ethereum blockchain

BTC: Bitcoin, the first and most well-known cryptocurrency

USD: United States Dollar, a commonly used fiat currency for valuing crypto art.

ROI: Return on Investment, a measure of the profit or loss generated by an investment.

NPV: Net Present Value, a financial metric that represents the difference between the present value of cash inflows and the present value of cash outflows over a period.

API: Application Programming Interface, a set of protocols and tools used for building software applications

UI: User Interface, the graphical layout of an application that allows users to interact with it.

UX: User Experience, the overall experience a user has when using an application or website.

DEX: Decentralized Exchange, a cryptocurrency exchange that operates on a decentralized blockchain network.

CEX: Centralized Exchange, a cryptocurrency exchange that operates on a centralized server.

HODL: Hold on for Dear Life, a slang term used in the cryptocurrency community to describe holding onto cryptocurrency assets despite market volatility

ATH: All-Time High, the highest price point that a cryptocurrency has ever reached in its history

FOMO: Fear Of Missing Out, a feeling of anxiety or unease that arises when one perceives that others are experiencing something desirable that they are not

FUD: Fear, Uncertainty, and Doubt, a strategy used to influence perception of a cryptocurrency or other investment by disseminating negative or false information.