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Crowdfunding via Application of Non-Fungible Token (NFT) Distribution Model as an Alternative Source of Finance.

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Abstract: The main purpose and objective of this dissertation are to show a trending approach to crowdfunding via the application of blockchain technology and non-fungible token distribution. Using NFTs as a way of alternative finance brings two notions together: fundraising and gamification. With the application of blockchain technologies, a new way of crowdfunding is observed. Instead, techniques of integrating gameplay mechanics into non-game contexts such as behavioral interventions and motivation may be utilized to increase user engagement as well as the quality of work, and the results of the study can be reported using gamification in this context. In this study, the primary objective is to determine why the crowdfunding approach, and specifically its use for fundraising via cryptocurrency, is gaining more popularity than traditional financing techniques. Overall, it can be argued that non-fungible tokens are more productive than fungible tokens to a certain level and that this makes fundraising procedures more appealing for investor communities.

*Gamification is 75% psychology and 25% technology – **Gabe Zichermann***

CHAPTER 1. INTRODUCTION

1.1. Description of the topic

Individuals use crowdfunding platforms to generate funds for a variety of projects over the internet. These platforms must be viewed as an important financial resource. Gamification is one of the approaches that can help users become more motivated and engaged. Gamified platforms have a lot of promise for encouraging users to participate in and interact in crowdfunding campaigns with the goal of increasing the amount of money that can be raised for projects (Golrang, 2021). Application of NFT (Non-fungible token) distribution to the investors in crowdfunding process gives exclusive rights and shares, especially the right transfers are more transparent than traditional businesses which are recorded on blockchain transaction records, which can't be erased or denied, by this technology the full rights of shareholders are reserved. The digital world has created a new class of assets known as one-of-a-kind non-fungible, irreplaceable assets called NFTs, which may be purchased and sold through the internet. They are intended to demonstrate that someone is the legitimate owner of a single digital item. In the digital world, an NFT is a sort of digital asset that may contain items such as paintings, banners and art books as well as, manifestos and other similar items that are recognized by a unique code. Each item is identifiable from the others by encoded data, and supporters may personalize them further by including their signature or even other distinguishing qualities. Aside from cryptocurrency exchanges and contractual agreements, which employ the same blockchain technology as NFTs and may be used in place of actual currency, the nonfungible tokens are not exchangeable or used for commercial purposes.

Each shareholder, so-called people who participated in the crowdfunding process, becomes a part of DAO (Decentralized Autonomous Organization) (De Flippi, 2021). DAO is a non-hierarchical organization governed by a group of people who set their own rules and make decisions based on smart contracts on a blockchain. The blockchain records all of its rules and transactions, obviating the need for a central authority. NFTs are becoming increasingly popular as a means of raising capital. An NFT can be created or "minted" from nearly anything, including a digital image of a sneaker, an athlete, or even this article. The NFT's versatility, as well as the fact that it enables authorized transfer of ownership of a unique product on the blockchain, make it appealing. Companies should evaluate any regulatory constraints that limit the use of NFTs for fundraising before considering an NFT offering.

1.2. Rationale

As all businesses require some capital initially to run their operations or projects, crowdfunding can be seen as a solution for some businesses, especially for those which have a community or a mass of fans to believe in the ideas or ideology of the founders. Though there are traditional ways to finance a business as well, crowdfunding campaigns can be taken into account as interest-free loans to start a certain startup or an idea. With the rise of Non-Fungible tokens

since the beginning of 2021, I have observed a certain pattern in these projects. They also follow the same kind of financing as crowdfunding campaigns, instead, they use cryptos for this purpose. According to Bloomberg based on market data NFT Market is already a 41-billion-dollar market and keeps continuously improving. NFT campaigns are using the crowdfunding method to boost their initial investments. This gamified approach to financing a business is observed very effective among project founders, according to this more projects get involved in this market and fundraise their campaigns via cryptocurrencies. Gamification has been actively used by several businesses to keep communities active and to reward them with multiple facilities. The same logic is also applied to the NFT campaigns. The community which entered into a certain project also gets the right to vote for the future of the campaign and members of the communities get access to participate in Decentralized Autonomous Organizations, such that not losing control over the decision-making of the project. The topic describes an up-to-date market for the emerging projects and helps individuals to create a solid base for their brands. The appearing of NFT marketplaces is so recent, a little bit more than a year, but projects were able to collect millions in the public and private sales during their first phases. Because of this trending wealth generation method, the research topic will focus on several areas such a psychology of the gamified projects, market data and several metrics which boosts post sales. At the end main research questions will get answers backed with the real market metrics.

1.3. The aims and research questions for the study

Key focus of the research is focused on the current market data of NFT projects launched in 2021-2022 period and to calculate the efficiency of these projects in crowdfunding. Main research questions will focus on giving a clarification to the non-fungible token description, in how many ways it can be used and how this technology can be applied to the fundraising process in our current business world. All these points are summed in a few questions and can be listed as below:

- What is a Non-Fungible token and why is it important for the future world?
   In this question main understandings about the non-fungible tokens will be given. The description and main application areas of NFTs will be discussed widely.

- What are the main benefits and features of using NFTs in the Digital economy?
   The following questions will focus on the research of how NFTs are traded and used as an asset in today's world. What kind of asset value do they carry and how the simple asset approach in the physical world get reflected in the digital economies will be the main research point for the question above.

- How raising funds for the projects can be gamified?
   NFT projects mostly promise an earning for their communities with a bunch utility. In this paper it will be discussed that how these projects give rewards to their community members, so called investors. Different from the traditional shareholder approach each community member

earns a random avatar from the collection, which are also items from the limited supply of passes for the projects.

- How efficient are NFTs as an Alternative Source to finance businesses?

Certain calculations will be made in order to answer this question. Such as comparisons of a traditional and crypto-led projects will be presents and the ROI of each kind of projects will be displayed in the table in results section.

-How NFTs can be used to prove your investment, patents and intellectual property?

In order to answer this question, IP – Intellectual Property Rights will be explained. The uniqueness and the transparency of this crypted codes can be easily tracked on the blockchain system. With the help of smart contracts certain rights are transferred to the second party, whoever gets involved in the NFT Projects and simply mint it through that contracts. Non-Fungible tokens also bring royalties to the owner and the business model will be explained in this paper.

1.4. The research's theoretical and practical relevance

The study's main findings and the author's perspective on the relevant topic in order to examine the impact of the NFT crowdfunding on the beginner projects can be easily applied to the further research of the fundraising methods and to achieve raising funds in a short period of time by businesses which want to get involved in. The report will be of interest to the fundraisers, startups, and donation campaigns all over the world that are looking for new methods and alternative financing opportunities for the projects. Furthermore, the proposed gamified crowdfunding method with the application of non-fungible tokens which are basically some lines of codes on the blockchain environment may be of interest within the context of the early development stage of businesses and for the ones which seek alternative sources to finance their projects. The method can be used for the early and ongoing phases of all kinds of projects.

1.5. Limitations

Main limitations for the research are as in the following bullet points:

- The research mainly focuses and used the data of top 10 or 15 projects & companies relevantly. The sample doesn't contain a lot of successful projects and companies which included in the results and discussion part.
- The collected data which reflects the raised funds of the NFT projects was displayed in ETH (Ethereum) on the market places so the crypto amount was converted into the USD amount, which is fixated in a current data amount within April. The current real amount can be higher or lower than the calculated amounts during conducting this research.
- Unavailability of source codes was one of the main limitations to the research. For analyzing the huge data from the NFT marketplaces each price per day inserted into a separate excel sheet and after sampling this data, the final one displayed in the Chapter 5 was prepared.

CHAPTER 2. THEORETICAL BACKGROUND

2.1. Application of Crowdfunding Method

Crowdfunding has a long and illustrious history, with roots that can be traced back to the 17th century. The purpose of this article is to examine how the past decade has shaped modern-day crowdfunding as well as how it has led to the recent spike in crowdfunding activity (Zhao, 2019). The very first significant example of crowdfunding was recorded in 1997, when a British rock band gathered funds for a reunion concert by asking contributions from their supporters through the internet. This was the first verified occurrence of crowdsourcing. It was this breakthrough way of funding that spurred the creation of ArtistShare, which was established in 2000 as a consequence of this revolutionary methodology of fundraising. (Hernández, 2020). Following this case, other crowdfunding sites appeared consequently, and each year, the crowdfunding industry has seen significant growth. As a widespread choice for entrepreneurs seeking to authenticate their thoughts and business ideas, acquire attention, and raise funds in recent years, the crowdfunding business has fast gained popularity.

Microfinance and crowdsourcing are two concepts that have influenced the development of crowdfunding (Morduch, 1999). A crowdsourcing project is defined as the outsourcing of an organizational capital creation to a strategically specified network of players through the use of an open call (Kietzmann, 2017) conducted through devoted sites (crowdfunding platforms). In addition, little amounts of money from a mass number of people had been added up over time.

Businesses may be able to raise crucial cash by soliciting comparably tiny financial contributions from the general public through the use of crowdfunding as an internet spread fundraising strategy, according to several theories. Taking this perspective, crowdfunding is understood as a homogeneous notion: a generic request for funds made through an open call for participants in a project. Apart from that, just as firms have different fundraising requirements, so too do the types of prizes that can be presented to supporters of crowdfunding projects (Belleflamme & Lambert, 2014).

Donation Based Crowdfunding – There are no incentives or benefits offered to contributors under the *pure contribution* model. Because the money received are effectively grants offered for a specified purpose without the expectations of a specific return to the funder, they are known as funding support (Lehner, 2014).

The donation model based on specific rewards includes an incentive structure in which donators receive nonmonetary rewards such as personal authentication or experience - based perks, such as that of the opportunity to connect the founders, take part in-person events, or perhaps even involved in the development of a product, in exchange for their contributions. (NCFA, 2015)

Lending Model Crowdfunding – P2B crowdfunding, also known as lending crowdfunding, is a type of crowdsourcing in which money is raised with the assumption that the funds will be repaid to backers by the creators of a firm. Lending crowdfunding has been the most popular type of crowdfunding in terms of total funding raised.

The pre-sale campaign for its first Pebble smartwatch is one of the most well enough in the industry. It garnered around $10 million from almost 70 thousand backers on Kickstarter platform, more than 100 times the initial funding aim, and Pebble shipped its opening batch of watches ten months after the crowdfunding campaign finished, according to the company (Schroter, 2014).

The traditional lending arrangement is based on standard conditions, with loan repayments and interest rates established before the campaign's beginning. In the case of a forgiving loan, funds are returned only if and then when the project begins to create profitability. Projects are evaluated according to respective levels of their risks, whether by the platform itself or by an outsourced assessor. This is true for both standard and forgiving loans. Lenders determine the level of risk they are willing to bear and then finance projects in accordance with that degree of risk.

Equity Model Crowdfunding – A venture receives funds from the people in exchange for equity of the company's ownership in the equity crowdfunding model, also known as investment crowdfunding or venture capital crowdfunding. In other words, shareholders are offered equity or bond-like shares in exchange for their money.

Equity based crowdfunding can be considered as the speediest crowdfunding sector, and the usual fundraising campaign is very considerable. A typical investor-led equity crowdfunding scenario involves accredited investors such as venture capital firms, seed funding, or industry specialists negotiating on behalf of a startup founder on the terms of the fundraising. In entrepreneur-led equity crowdfunding, fundraisings are open to every community backer, and the campaign advocate sets the pricing and terms of the contribution on his or her own behalf (Wagner, 2014).
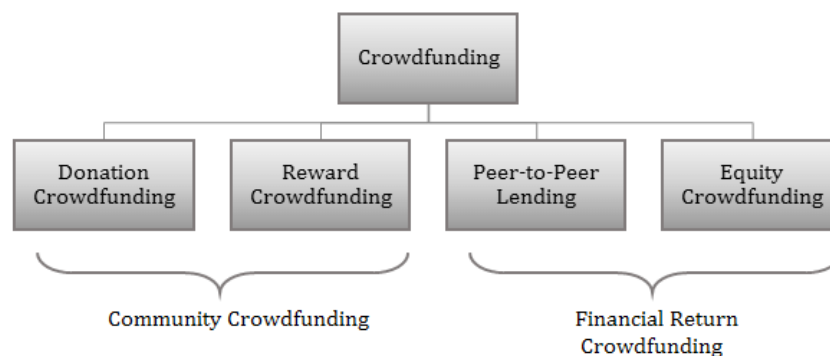
Figure 1. Types of Crowdfunding – Short Description [Source: Conference: Microfinance and the sustainable development goals – 2019]

There are exact scenario patterns for each crowdfunding stage as in the following list:

Pre-startup – In the pre-startup phase of the crowdfunding life cycle, the founder has an idea and investigates whether or not it is feasible to form a business around it. In the pre-startup phase, the emphasis is on building a viable offering that solves a substantial consumer problem as well as identifying the target market, potential business partners, distributors, and competitors. The achievement of problem/solution fit as well as the development of a sustainable business plan are critical during this developmental period (MaRS, 2009). Pre-startup research and development, quality assurance, the development of a business plan, and the preparations for launching the enterprise are the primary funding requirements. Donation crowdsourcing is the most appropriate method of fundraising to achieve these requirements for three reasons. For starters, it does not provide a tangible reward to a large group of people. At this stage, whenever the company has not quite produced income first from offering, it is still building the business plan and, in most cases, does not have a formal financial plan or any previous proven record to fall back on. The chance of project failure is at its highest point at this point, and the founder is therefore unable to make any promises in terms of tangible or monetary compensation. Second, donation crowdfunding often provides greater business agility as compared to other forms of crowdfunding, which typically impose additional constraints on the financial contributions made by a crowd. In addition, the common features of donation-based crowdfunding initiatives help to limit the likelihood of disappointing crowd members to a minimum. Individual donations and overall financial goals are typically modest in scale (Heyman, 2015). At the next step of the company life cycle, donation crowdfunding might potentially provide the required funds to propel a venture to the next level, at which time owners should review their fundraising strategies.

Startup – In order for the enterprise to go to the initial phase, it must first determine whether the idea is feasible and whether the business model is credible enough in order to provide the service to a desirable target market. Activities now center on refining the solutions or prototype into a minimal viable product, as well as developing the initial financial model into a sustainable business strategy (Moogk, 2012).

In the beginning phase, resources are necessary to produce products for prospective consumers to test, hire staff, streamline operations, position the product in the market, and implement the marketing strategy for the commercial launch of the company's first commercial product. After developing a successful product that has gone through several iteration cycles and generating some initial income, the firm may more credibly offer concrete benefits, such as cash interest or a pre-sale product, to attract more investment. In addition, one of the most important objectives throughout the startup stage is to assess product/market fit. It assists in achieving this aim by giving a real-time estimate of demand and clients' readiness to pay, which is especially significant in the context of pre-sales models (Churchill & Lewis, 1983). It also helps to establish an initial group of enthusiastic early adopters, which provides a competitive edge for the company's operations. Finally, financial requirements for the start - up stage are significantly higher than those for the pre-startup stage.

Growth – The maturity stage is often initiated after the company has matured into a high efficiency and lucrative organization. The venture is financially sound, has a large enough market and adequate market penetration, and has exhibited product and market validity, among other things (Churchill & Lewis, 1983). Startup activities are primarily concerned with expanding operations, processes, and systems in order to, at the at least, maintain profitability, but ideally to grow and make an above-average economic return on the resources invested. As the startup switches into growth mode, it has seen rapid expansion, which is projected to continue in the future. The funds raised at this stage are intended to promote future expansion and may be used to assist the startup in acquiring another firm as a means of achieving scale, as well as to offer liquidity and an exit for the founder.

Equity crowdfunding, which provides investors with a cash return, is the most suited sort of crowdsourcing for businesses in the growth stage. The amount of cash required to build and grow a firm is often large, and it is frequently out of reach for those that use donation or loan crowdfunding models. Due to the larger average financing amount for an equity crowdfunding campaign, this sort of campaign is more suited than other types of campaigns.

When a venture's risk of loss decreases, the company is better equipped to give monetary incentives with greater credibility than when the business first started out. This crowdfunding approach is a good fit at this point since growth brings with it the possibility of organizational transformation and a transfer of power (Cumming, et al., 2019). It has become reasonable to distinguish between the entrepreneur and his or her firm; the startup is dispersed and frequently structured by core roles. As a result, during the growth period, the founder is often more receptive to the concept of relinquishing some ownership and control of the firm, which is a condition of equity crowdfunding by its very nature.

2.2. Appearance of Non-Fungible Tokens. Definition and Main application Areas

Cryptographic assets on a blockchain, non-fungible tokens (NFTs) are digitalized assets that have exclusive identifications and metadata that identify them from each another. Dissimilar from cryptocurrencies, they are not accomplished of being traded or exchanged at par value. This is in contrast to fungible tokens, such as cryptocurrencies, which are indistinguishable, as a result, can be used as a means of exchange for commercial transactions. (Coin Telegraph, 2021). Due to the fact that each token is unique and irreplaceable, NFTs alter the cryptographic paradigm, making it impossible for one non-fungible token to be considered the same as another. In essence, they are digital representations of physical assets that have been compared to digital certificates since each token contains an individual, non-transferable identity that allows it to be identified from the other tokens currently in circulation. They are also extensible, which indicates that by pairing two NFTs together, you may develop a third, one-of-a-kind NFT that is completely different from the first.

The first appearance of NFTs was in 2015, and after a few months, the Ethereum Blockchain made its introduction. Users were able to purchase, sell, and construct structures on hexagonal

swathes of digital land displayed on a big map as part of the project. It didn't garner much attention when it first launched, and it was left abandoned on the Ethereum blockchain for years. Later on, in early 2018, Matt Hall and John Watkinson started a project called Crypto Punks, which they named after their initials (Matney, 2021). Firstly, project launched as an art project which founders created a generator and a pixelated character with numerous items was used as base, after then 10,000 unique characters made out of initial base items. So, this art project was hosted on Ethereum Chain since then.

Figure 2: Sample Avatars from Crypto Punks Collection [Source: https://cryptopunks.app/]

Non-fungible tokens are an extension of the relatively simple notion of cryptocurrencies, which was introduced in the first place. Modern finance systems are comprised of complex trading and financing systems for a wide range of asset kinds, ranging from real estate to lending contracts to artwork, among other things. NFTs, by making it possible to create digital representations of physical assets, offer a significant step forward in the reinvention of this infrastructure.

The formation of new markets and forms of financing is the most exciting opportunity for non-financial organizations in terms of growth and profitability. Consider a piece of real land that has been split into a number of stages, each of which contains a unique set of attributes and distinct intrinsic characteristics. When it comes to location, one division may be positioned near a beach, another subdivision may be placed in an entertainment area, and still another unit may be located in a residential area. An NFT represents a single piece of land, and each piece of land is valued differently based on the characteristics that distinguish it from the others. By include critical metadata in each every NFT, it is feasible to make real estate trading, which is a difficult and administrative undertaking, more uncomplicated.

Non-fungible tokens can be used to digitally represent any asset, including assets that are only available online, such as digital artwork, as well as physical assets, such as real estate. Additionally, in-game commodities like avatars, digital and non-digital collectibles, domain

domains, and event tickets are examples of the types of assets that NFTs are capable of representing. The term "fungible" comes from the financial and accounting works of literature, and it is defined as whatever may be exchanged for another object that is identical or similar in shape or size to the original. It is this property of fungible things that allows traditional forms of currency, whether they are equivalent amounts of paper money or identical units of precious metals to serve as mediums of trade since they are perceived to be equal in value. Because they are both fungible, it is possible to substitute a 5-dollar bill for five 1-dollar ones in cash form.

Regulation commodities, common stock (stock options), financial options, and bills of money are all examples of assets that are usually regarded as fungible. A non-fungible asset, on the other hand, maybe a person's car, for example, because someone who borrows a friend's car will not be able to repay their debt to their buddy by giving them another person's car as a form of repayment. Baseball cards, as a simple example, can be classic examples to distinguish fungible and non-fungible assets since each card has its own set of features that either increase or decrease its value when compared to other baseball cards in the collection. When it comes to establishing their uniqueness and distinguishability in the virtual domain, things were first deemed to be difficult to prove in order to be classified as "non-fungible" in the first place. To a significant extent, code is just that: 1s and 0s that can be regenerated and are therefore interchangeable.

It is partially predicated on human perceptions of what constitutes exchangeable capital and how much of it circulates for expenditure that the concepts of scarcity and value in a capitalist system are based on. The economics of the coronavirus pandemic have shaped the period in which NFTs have come to public prominence, with impossibly massive quantities of stimulus money being created in such a short period of time to stimulate economies at a time when real, material activity has slowed to a standstill (Chohan, 2017).

2.3. Usage of Non-Fungible Tokens as a raise funding mean

Crowdfunding campaigns, whether they are equity or non-equity based, entail people participating by contributing capital to help the campaign attain its objectives. It is possible to encode this act of participation using the NFT code. An NFT of this nature can subsequently be owned by all of the individuals who participated in the fundraising effort.

This NFT will serve as a memento of involvement, as a part of a certain community, while also serving as a piece of digital art. You could say you were slaying several birds with one stone.

Novelty and usefulness are the two basic classifications of the value that NFTs add to a product or service. Both can be used to benefit organizations in the nonprofit sector. Because they are built on the blockchain, NFTs are, by definition, one-of-a-kind. Because of the rarity, this adds value to the product. Consider a limited-edition Rolex or a set of rookie baseball cards. The creation of value-aligned art and the raising of awareness and funds, as demonstrated by Dainty Dolphins, are examples of how non-profit organizations might employ NFTs right that way.

In order to raise and distribute funds for charity causes and nonprofit organizations, there are two primary methods used by non-profit organizations. The first method is the traditional method of making a profit by selling NFTs. Either by minting an NFT and selling it, or by "flipping" an NFT by selling an existing asset for a higher price than it was originally purchased for, this can be accomplished. The vendor then takes their revenue and chooses a charitable organization to whom they will donate all or a portion of their proceeds. Mr. Jack Dorsey, famous co-founder and former CEO of well-known social media company Twitter Inc., converted his first ever tweet into an NFT and sold it for $2.9 million, with the proceeds going to GiveDirectly (Locke, 2021). Just a simple example how NFTs gain attention we can see the current offer made to this twitter recently, sixteen times more than the initial purchase amount, valued at 48 million (Ossinger, 2022).

NFTs, as a novelty item, can be used in a similar way as organizational swag to increase brand awareness. Providing access to an NFT in lieu of a T-shirt, for example, in exchange for raising a specific amount of money for a charitable walk or race Organizations can also use NFT art to generate funds as a stand-alone fundraising effort. For its 75th anniversary at the United Nations, UNICEF has just launched 1,000 non-financial donations (NFTs) to generate funds and awareness for education and children (Chow, 2021).

NFTs are extremely useful since they allow for the ownership of digital assets. They have transformed the digital arts and collectibles market, but they can also be employed in other areas, as seen in this piece, and they are becoming increasingly popular. However, because NFTs are still relatively new, we are only scratching the surface of what we can achieve with them. This is quite exciting.

2.4. Decentralized Autonomous Organization and application of DAO model.

A decentralized autonomous organization (DAO) is a type of organization that does not have a central leadership structure. It is decided from the bottom up, regulated by a group organized around a certain set of rules enforced on a blockchain, and decisions are taken from there (Faqir, et al., 2020).

DAOs (Decentralized Autonomous Organizations) are internet-based organizations that are collaboratively owned and governed by its members. These organizations have built-in treasuries that may only be accessed with the permission of their members. Decisions are made by ideas that are voted on by the group over a certain period of time.

A decentralized autonomous organization (DAO) operates without the use of hierarchical management and can be used for a wide variety of purposes. These groups make it feasible to form freelancer networks where contracts combine their earnings to pay for software subscriptions, philanthropic organizations where members approve payments, and venture capital businesses run by a group. DAOs operate through the use of smart contracts, which are simply bits

of code that are automatically executed if a set of criteria is met. Smart contracts are already being used on a wide range of blockchains, but Ethereum was the first to implement them in this way.

The smart contract that serves as the foundation of a DAO is its backbone. The contract establishes the norms of the organization and serves as the group's treasury, among other things. Once the contract is live on Ethereum, no one other than the contract's creators can change the rules without a majority vote. Anything attempted that is not covered by the rules and logic contained in the code will be rejected by the program. Furthermore, because the treasury is established by the smart contract as well, no one will be able to spend the money without the agreement of the entire group as well. This means that decentralized autonomous organizations (DAOs) do not require a central authority. Instead, the group takes decisions as a whole, and payments are automatically allowed when votes are unanimously approved (Norta, 2015).

For a variety of reasons, Ethereum is the ideal platform for decentralized autonomous organizations (DAOs):

- It is possible for enterprises to place their trust in the Ethereum network because of its distributed and proven consensus.
- Once a smart contract is in operation, it cannot be amended, even by the contract's creators. This enables the DAO to operate according to the rules that were programmed into it.
- Smart contracts have the ability to transmit and receive funds. To manage group finances in the absence of this, you'd have to rely on a reputable intermediary.
- It has been demonstrated that the Ethereum community is more collaborative than competitive, enabling for the rapid development of best practices and support mechanisms.

These smart contracts serve as the foundation for the decentralized autonomous organization's laws and regulations. Members of the public who take an interest in a DAO are later awarded voting rights, and they have a direct impact on the organization's operations by participating on or propose alternative governance ideas.

Due to the nature of the proposition approval process, DAOs are protected from being swamped with proposals. A proposal will only be authorized if it wins consent from a majority of participants. According to each decentralized autonomous organization's smart contract, the process through which this major part is computed differs. Decentralized Autonomous Organizations are completely autonomous and transparent organizations. Because they are constructed on open-source blockchains, everyone can access the code that they have written. In addition, because the blockchain keeps track of all money transactions, anyone can audit their built-in treasuries (Hsieh, et al., 2018).

Because the code is publicly available and can be thoroughly tested before being released, it is easy to put your faith in it. Every action taken by a DAO once it has been formed must be approved by the community and must be entirely transparent and verifiable by anyone. A hierarchical structure is absent from such an organization. Despite this, it can still perform

activities and expand while being managed by stakeholders through the use of its native token. Because there is no hierarchy, any stakeholder can put up an original concept that will be considered and improved upon by the entire group as a whole. Internal disagreements are frequently resolved quickly and easily through the voting system, which is in accordance with the pre-written regulations in the smart contract (Madhusudan Singh, 2019).

DAOs provide investors with the opportunity to combine their funds and participate in early-stage enterprises and decentralized projects while sharing the risk and any gains that may arise as a result of their investments, according to the organization.

They are particularly advantageous in providing a solution to the problem of principal-agent dilemma. This dilemma is characterized by a conflict in urgencies between certain people or groups and others who make decisions and act in their best interests (Grossman & Hart, 1992).

Problems can arise in a variety of settings, with one of the most typical being the interaction between stakeholders and a chief executive officer. While working for the principal (the stakeholders), the agent (the CEO) may behave in their own self-interest, rather than in accordance with the priorities and goals established by the principal (the stakeholders).

The principle-agent dilemma can also manifest itself when the agent is forced to take on an excessive amount of risk since the principal suffers the financial cost. Traders can employ enormous leverage to chase a performance bonus, confident that the company will cover any losses if the trade does not work out.

Direct action organizations (DAOs) resolve the principal-agent issue through community governance. Stakeholders are not compelled to become members of a DAO and only do so after thoroughly comprehending the rules that govern the organization. They are not required to put their trust in any agent acting on their behalf, and instead work as part of a group whose motivations are aligned with their own.

Because of the nature of a DAO, token holders' interests are aligned because they are incentivized not to be bad. Because they have a vested interest in the network's success, they will want it to be a success. Acting in opposition to it would be a violation of their own self-interests.

Traditional corporate structures include a founder, chief executive officer (CEO), or some other governing body, and sometimes even a board of directors. This individual or small group has complete control over the direction that the company will follow. Its centralized governing body has complete control over every choice it makes, every mission it undertakes, and every goal it sets for itself.

Typically, the further you are from the centralized governing body, the less influence you have. This is especially true for traditionally built companies. At the top of the organization, there is typically a president, founder, or CEO, who is followed by a vice president, manager,

supervisor, team leader, and finally an employee. Moreover, as you move up the corporate ladder, people's opinions on what the organization is doing and why it is doing it become increasingly unimportant (Ethereum.org, 2022).

However, smart contracts are not only beneficial to giant organizations; they are also beneficial to individuals. Businesses of all sizes, even small ones, might save time and money by eliminating middlemen, red tape, and escrow costs as well as the need for real estate brokers. If the task is completed, the money is put directly into their bank account, eliminating the need to wait for an invoice to be reviewed and approved, or for banks to process their fees and commissions. One of the most wonderful aspects of the interaction between an NFT and a DAO is that one can contribute to the development of the other. Both NFTs and DAOs are built on smart contracts, and they can be constructed in conjunction with one another.

The smart contract of your NFT can be programmed to assist in the funding of your DAO, such that every time the NFTs are sold, a part of the proceeds is automatically transferred to the DAO. Based on the other smart contracts currently in place and its aim, these monies may be used to assist it to reach one of the goals on its roadmap or to establish a new project.

This hierarchy does not exist in the case of a DAO. Everyone is just a member of the organization, and everyone has an equal voice and equal voting power as a result of the organization's organizational structure. Furthermore, the individual who founded the DAO might leave the organization at any time, and everyone else would continue to carry out the goal.

In a DAO, for example, there is no way to manipulate the outcome of a vote. Everything is based on smart contracts, and depending on how you wrote those contracts, everyone who has the requisite tokens has a say in who gets to represent them in the election. And because everything is transparent and on the blockchain, everyone can see what is going on. You will not be able to counterfeit these tokens or trick your way into a higher number of votes than you already have (Zichichi, et al., 2019).

2.5. Digital Ownership, Uniqueness, and Value.

Non-fungible tokens are indeed good for use in the context of identification control. Take the example of actual passports, which must be presented at each and every port of arrival and exit. When individuals' passports are converted into National Identification Cards, each with its own unique serial qualities, it becomes important to break down the entrance and leave operations for governments throughout the world. In addition to this use application, NFTs may also be used for identity management in the digital environment, according to the authors. (Times Financial, 2021).

Genuine ownership, rarity, and one-of-a-kindness are difficult to verify online, making it difficult to decide how to value works made in the digital domain with precision. The inability to start and manage monetized creative firms has made it very difficult for digital artists to succeed. As a result, possibilities for intellectual exploitation and imitation have arisen. Perhaps most detrimentally, it has made it more difficult for individuals and would-be collectors to place a monetary value on digital art in the same way that we place a monetary value on physical art.

NFTs represent a watershed moment in the history of digital art and other types of internet media. As a result, they enable for the creation of online assets with provable scarcity and ownership that can't be altered. They bring into the digital sphere the aspects that give tangible art and assets their monetary or sentimental worth. While on their journey, they open the doors to valuable digital art and provide artists with options that were before unavailable to them.

NFTs are also verifiably one-of-a-kind, which is important. When a user on a blockchain system mints (creates) an NFT, they are minting a certain quantity of tokens, which is determined by the user. This is why NFTs are sometimes referred to as "1×1" or "1x100," indicating their rarity in relation to the total number of similar NFTs produced in a given minting occurrence (in this case, one). Those materials are immutably validated to have emerged from a certain author at a specific point in time once they have been made available for public consumption. No matter how many further NFT artworks are minted by the very same artist in the future, it will always be publicly and permanently provable which NFTs were part of the initial set and which NFTs were part of later sets. Whenever these non-fungible tokens are released on a public network such as Ethereum, the information is available for everyone to view, decreasing the cost and complexity of proving the legitimacy, originality, uniqueness, and ownership of certain assets.

Once NFTs have been coined by artists and sold by collectors, they may be exchanged among collectors and art groups in the same way that any other secondary market operates. The provenance of each NFT is always available, allowing collectors to confirm the originality of each piece before purchasing or bidding on it. Furthermore, NFTs enable automated commissioning, which is only one component of NFTs' one-of-a-kind capacity to empower artists through the use of digital mediums. NFTs may be inbuilt to refund a specific proportion of every sale to a specific address, which can include the minter's initial address, because they are unique bits of code on a

blockchain network. This implies that even if the artist has no direct impact over the sale of their artwork, they will continue to benefit from future sales of their work.

NFT collectibles even have access to use the IP (Intellectual Property) rights for commercial use. For example, one of the Bored Ape Yacht Club owners used his Intellectual Property Rights to found a fast food brand on his NFT item, called Bored & Hungry.

Bored & Hungry uses a system known as "Token Gating," which is an interesting feature. A Quick Response code is used in order to browse clients' MetaMask wallets for NFTs such as $APE coin, Bored Ape and Mutant Ape Yacht Club, or Bored Ape Kennel Club NFTs. The program was built by Campus Metaverse, which is situated in Irvine, California. Ownership of the cryptocurrency or NFTs entitles you to a variety of benefits at the restaurant, including free combos and other incentives.

Figure 3: BAYC Commercial Usage example: Bored & Hungry [Source: Business Insider - The wildly hyped Bored Ape Yacht Club-themed fast food concept in California- 2022]

2.6. Gamification of crowdfunding process

Gamification can be defined as the practice of applying game techniques and motives into projects or business models in order to increase the interaction of the people. Game mechanics can be applied almost in anything in wide range, any website, e-commerce sites, online engagement of the communities. The main motive behind this technique is accelerate participation, engagement and interaction as much as possible. Also, this model is observed as a pioneer for the further loyalty of the community. Gamification is a purposeful endeavor to improve processes, businesses, enterprises, and engagements in order to garner encounters similar to those observed in games in order to encourage and increase engagement. This is often achieved by employing game-design components and gaming concepts in quasi environments (Hamari, 2019).

Gamification did not become widespread until 2010. Even before the term was created, other fields regularly took features from videogames; for example, some work in learning disabilities and scientific visualization utilized gaming elements.

The term "gamification" first appeared in the media in 2010, referring to the incorporation of social/reward components of games into software (Zichermann & Cunningham, 2011). The strategy grabbed the eye of venture capitalists, one of whom remarked that gamification was the most potential game industry. According to another survey, half of all entrepreneurs seeking investment for consumer software products included game design in their pitches.

A collection of emotions, actions, and wants found in game mechanics that resonate with people is referred to as game dynamics. Competition via top charts, teamwork through team objectives, engagement by viewing other players on a feed, collecting through earning distinctive badges, and novelties with accessing side missions are some examples. Game dynamics are utilized in conjunction with game mechanics to increase participant engagement and motivation.

Instead of purchasing a replica of an artwork, NFTs have swiftly become the virtual equivalent of getting an original piece of art. Despite the fact that they appear to be similar on the wall, only one individual may have the honor of having the real stuff.

The extremely valuable aspect of NFTs may also be observed in a variety of tangible consumer items, such as jewelry and watches. At the end of the day, a super-rare YuGiOh card is only a piece of cardboard (Yaseen, 2022). However, it is the uniqueness of that precise design – as well as the status of being the owner – that is driving the demand for it.

Because each NFT is one-of-a-kind, the face value of tokens is far higher than the value of the real tokens they represent. When you combine this with the fact that they are relatively scarce, you have the makings of a hot new consumer craze.

Scarcity is a consumer favorite. The unexpected rise in popularity of non-traditional technologies (NFTs) is an excellent illustration of how supply influences perceptions of value. The

more difficult it is to get something, the more desirable it becomes. As near-field communications (NFTs) become more widely used, they are challenging popular assumptions of digital commodities as being omnipresent and lacking in tangible value. To exist, NFTs require only one thing: content. Notwithstanding their complicated blockchain foundations, NFTs cannot function without content. NFTs would have little incentive to exist if there were not a large demand for unique and fascinating information on the internet. When you consider how intensely competitive the marketplace has gotten, it's a significant indicator of how important it has become for businesses to create and distribute appealing content in order to keep customer attention.

Most likely in all existing NFT projects we can see that the holder owns a special character with unique traits backed with the 1 of 1 metadata. This sense of ownership causes special interest for the one who enters the projects, so called who invests in the exact project.

For the uninitiated, an NFT avatar is a digitally created picture that is cartoonish or pixelated in appearance and is used in NFT games. Character imagery is frequently shown in the form of a profile photo in an NFT avatar. The characters are usually shown from their shoulders upwards in an NFT avatar. However, what distinguishes an NFT avatar from the others is that it is frequently designed with distinctive aesthetic characteristics. You can come across NFTs of an abstract character that appears to be from another universe or a known character with a bizarre appearance. Because no two avatars are alike, your avatar will always have something that distinguishes it from others (Tensil, 2019).

NFT avatars, on the other hand, follow in the same footsteps and may fetch millions of dollars in the proper market. Users may also purchase avatars that are compatible with their devices and show them on a variety of platforms:

Opensea – It is an open, inclusive web3 platform where folks can come to learn about NFTs and interact with one another to buy and sell NFTs. It is a way in which individuals can come to learn about NFTs and connect with one another to buy and sell NFTs.

LooksRare – A decentralized, community-driven NFT marketplace that actively pays traders, token holders, content creators, and collectors for their participation on the platform.

Kalao – A premium platform where users may create, purchase, sell, and collect their favorite nonfictional characters (NFTs). This framework will help to speed the adoption of virtual reality technology in order to create virtual worlds and to maintain the digital transformation of commercial applications.

Rarible – A visual artist or producer may create and sell unique crypto assets that reflect ownership in their digital work using Rarible, a platform that allows them to do so. Remarkable is that Rarible is both a marketplace for those assets and a distributed network based on Ethereum that allows for the transfer of those items without the need for an intermediary.
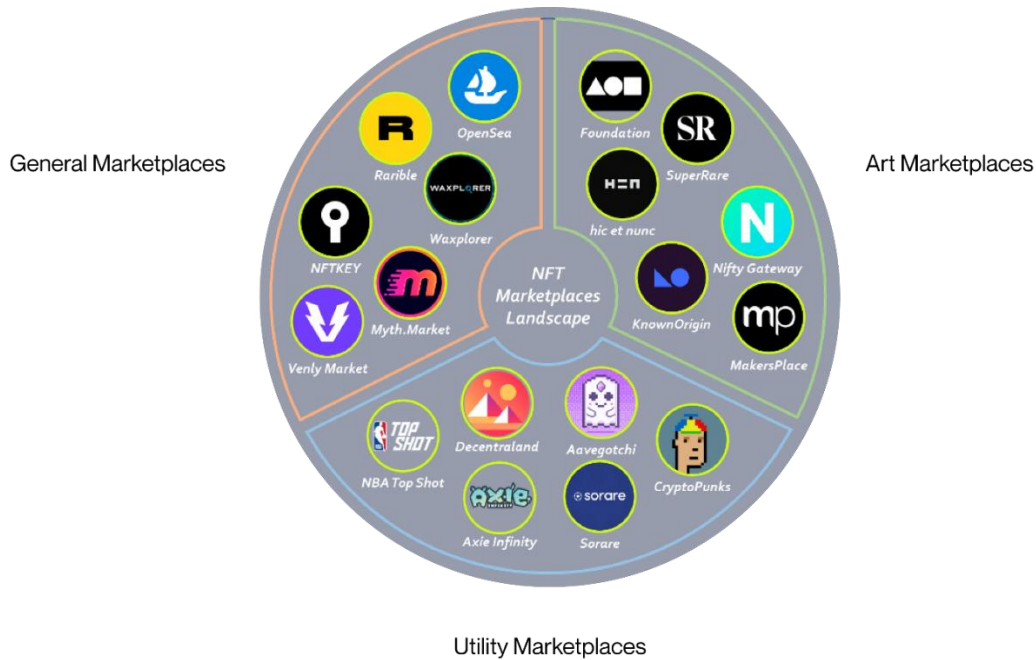
Figure 4: Famous NFT Marketplaces Landscape [Source: NftTech.com - A Deep-Dive on NFT Marketplaces – 2021]

General Marketplaces: This section of NFT markets covers sites who take a universal approach to their listings, providing for sale NFTs from a wide variety of projects and performing a myriad of tasks. Naturally, this generalist approach implies these marketplaces can serve to a bigger audience and hence grab a higher proportion of the total addressable market. General markets may be further classified based on whether they are aggregators – meaning they list NFTs being offered for sale on third-party marketplaces as well as their own – or adopt a more autonomous listing strategy. Notable examples of generic markets are OpenSea (Devin Finzer, 2017) and Rarible (Foxley, 2021).

Art Marketplaces: Art-oriented markets, as opposed to their generalist equivalents, are dedicated to the listing and sale of tokenized high-end artworks, as opposed to generalist marketplaces. NFTs of higher value and lesser volume are offered for sale on these platforms in a manner similar to that of luxury auction houses in the actual life. A more restrictive approach is taken by art-centric markets when it comes to growing their community of sellers, requiring aspiring digital artists to complete some kind of verification before being allowed to sell their work through the marketplace. SuperRare (SuperRare Team, 2021), and Foundation are just a few instances of art-centric markets that are worth mentioning.

Utility Marketplaces: With this last classification, any marketplaces that was created with the goal of facilitating the trade of products for a specific digital marketplace falls under this category. For example, blockchain-based games and collecting sets will frequently be supported by a first-party marketplaces where users may swap their holdings for those of other users. These

marketplaces may accommodate a diverse range of asset listings, ranging from in-game commodities to digital parcels of land to collectibles with increasing value.

As previously stated, each NFT avatar is distinct from the others. While a user has the ability to copy and paste that picture anyplace, the true ownership of the avatar remains with the creator. The fact that these avatars are constantly being purchased, just as they are in the art world, has resulted in a shortage of highly desired ones. Avatars from limited edition NFT collections have seen their prices soar, depending on how old they are and how rare they are. As a result, if you're a user who enjoys all of this, it seems reason that you'd consider purchasing an NFT that is both scarce and precious. This, in turn, feeds the NFT avatar boom engine, which propels it ahead even farther (Jahn, et al., 2021).

People have things that are nice and flashy, and they want new things all of the time. They desire to be a part of specific organizations and communities, and to associate with them. The majority of buyers of NFTs do not purchase a single piece, as they would at an art auction. Instead, they became active participants in the project's Discord, Twitter, and Instagram communities early on and contributed to its development. Not purchasing a product, but rather co-creating and working on side projects in the digital world – an example of the IKEA effect, where it is easier to acquire a sense of belonging when you construct it yourself (Norton & Mochon, 2012). And once the collection has been completed and has grown. The possession of those NFTs serves as a membership card to their exclusive private club — it signifies their social standing and the values they uphold.

While these avatars are employed for a variety of objectives, it does not rule out the possibility of their having further benefits. There are entire towns developed around some of the NFT collections. These communities may provide additional benefits that are unique to that particular collection. For example, some NFT communities provide members with access to an exclusive Discord server and Discord channel after they have purchased an avatar.

In addition to the several popular NFT collections available, each collection has its own distinct aesthetic style and set of guiding principles. What is appealing to one user may not be attractive to another user in the same way. Some, on the other hand, have stood out and have grown increasingly popular with everyone. The following are some of the most popular NFT avatar collections:

Bored Ape Yacht Club – The Ape Yacht Club, which was established in 2021, is a collection of 10,000 individual ape avatars, each of which was coined on the Ethereum blockchain and then distributed to members. Each of these one-of-a-kind assets has its own distinct design, and no 2 apes are same in appearance. Despite its very short existence, the Ape Yacht Club has already gained widespread recognition, with avatars of the collections soon becoming desirable artifacts.

Furthermore, those that own an ape instantly receive a Yacht Club membership card, which entitles them to exclusive member advantages. Ape NFTs may now obtain a digital passport, which allows them to integrate your apes into some other play-to-earn game as your profile image.

Figure 5: Bored Ape Yacht Club NFT Avatars Collage [Source: El País: Euphoria in digital art: A bubble or an NFT revolution? - 2021]

Azuki – Azuki is a collection of one-of-a-kind avatars on the ETH blockchain. Azuki NFT avatars have a really vibrant art style, which makes them even more appealing to the eye than they already are. Although owners receive nothing more than a virtual avatar, they do have access to the Garden (the project's virtual universe). The Garden is a private location that will over time provide products like as streetwear, NFT drops, live events, and other special events to visitors. The Metaverse, according to Azuki, is where you will be identified by your avatar, which means that we may be able to utilize these across several applications and games.
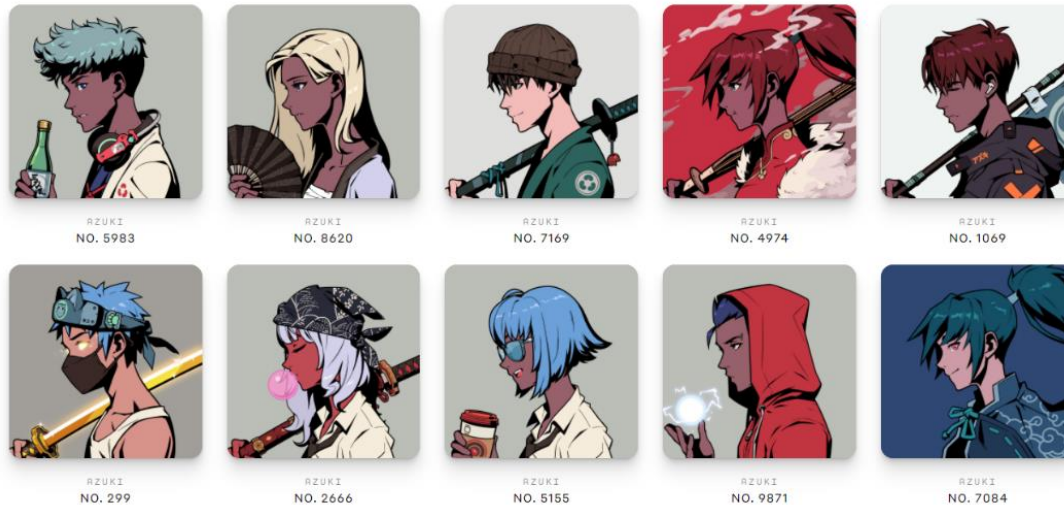
Figure 6: Azuki NFT Avatars Collage [Source: Forbes - How Azukis Suddenly became the World's Best-Selling NFT Collection - 2022]

Roadmaps & Missions of Non-Fungible Token Projects – In general, an NFT roadmap is the long-term goal that an NFT project has for its implementation. A roadmap is a step-by-step method for an NFT project to demonstrate how they aim to add value and, in many cases, to demonstrate that they are a worthwhile investment. Roadmaps frequently include a timeframe for the introduction of fresh NFT, the airdropping of new NFT to holders, and other details. Because the NFT industry evolves at such a rapid speed, adhering to a specific plan is not always possible; nonetheless, having a rough notion of how the project will go is essential.

A solid NFT roadmap will also have a long-term perspective and a variety of methods in which value will be given to holders; an incentive to hold the NFT for the long haul is always a positive development. Clarity and conciseness are desirable qualities to seek, as are attainable, logical milestones that investors can evaluate objectively and scientifically assess.

For example, airdrops or the potential to make passive revenue by staking the token from an NFT project should be included in the long-term vision, among other things.

It is defined by long-term investments in which the firm transforms the NFT idea into a complete and comprehensive business in which you are rewarded for being a holding company shareholder.

As a result, NFT roadmaps are frequently used as a graphical representation of a pitch deck. Its objective is to help generate enthusiasm about a project's future potential, as well as to provide investors with a notion of when they might expect to see expected targets, among other things. Despite the fact that NFT roadmaps are a crucial tool for project founders, they are not the "holy grail" that several investors believe them to be. You can have the most brilliant strategy in the

world, but if you are unable to put it into action, you will fail. Furthermore, there is almost no assurance that the plan will ever be completed in its whole. Investors, on the other hand, will want to know how you intend to generate a return on that investment.

Setting SMART objectives (Specific, Measurable, Actionable, Realistic, Timebound) that are both reasonable and feasible for the team is at the heart of a successful NFT roadmap. In turn, this fosters responsibility and the effective accomplishment of the objectives, which in turn fosters confidence in the team's ability to undertake. Because the launch of an NFT is comparable to that of a fundraising campaign, it is critical that founding communicate and interact proactively and often on the status of their plan. Founding members are trying to put their credibility on the line, it is even more critical that they devote the necessary time and resources to developing a plan that they can follow through on. The goal of NFT initiatives is not to generate short-term income, but rather to generate long-term value through the services they provide.

A good roadmap is a distinction between a visionary and a rug puller (can be defined as a malicious action in NFT issuing, which ends with the immediate vanishing of the developer team or the project founders after collecting some funds) project. Of course, in case of visually visionary projects it's not the only criteria that they have a long-run mission, but also the credibility of the teams is important. An ideal team should be public and available to the community, because anonymous projects mostly end with rug pulling.

A good roadmap mostly outlines the details of the project in several pieces, most likely in form of quarterly objectives. It is a famous way of displaying for the NFT projects that the team shows the long-term plan showing each quarter's goal via using acronyms, such as Q1, Q2, Q3, Q4 and in which year the plan will realize.

CHPATER 3. LITERATURE REVIEW

Literature Review will consist of several parts including the base of the technical components on which initial ideas the topic relies on, and how the purchase process occurs via Smart Contracts; description of standards and protocols will be mentioned, the paper will dive into the gamification notion regarding to the current trending NFT collection logic and explain the basis how this process attracts individuals and different parties, the psychological side will be emphasized and different phases of this process and life cycle will be presented.

In this chapter main publication will be discussed in order to prove that we can conduct a crowdfunding process via non-fungible tokens. Publications about the economic behavior of the investors will be included which show the application of gaming elements in this crowdfunding process.Main goal of this paper is to show the efficiency of automatization of crowdfunding and its outstanding perks in the long-run.

3.1. Crowdfunding via non-fungible tokens

With the rise of Bitcoin which was introduced to the world not more than two decades, the blockchain system has integrated our lives since then. It came as a solution to the world in a way of distribution and decentralization for digital currency management. (Nakamoto, 2008)

Unfortunately, because of the primitivity of its structure Bitcoin is not as vital as Ethereum layer in creation and deployment of smart contracts. Ethereum played a crucial role in expansion and development of the idea behind Bitcoin. The users or requester in a certain process needs to pay a fee, so called gas vee in order to get verified and fulfill the contract requirements. Ethereum firstly created its first token protocol called ERC-20 tokens, which is a spark for the idea of non-fungible tokens. (Vogelsteller & Buterin, 2015). The focus of this standard is creation of fungible tokens, but in terms of the research focus of this paper ERC-721 protocol will be defined broadly.

In order fulfill a crowdfunding process via NFTs and ERC-721 standard there are certain steps needed to make it happen:

1. Creation of Smart Contracts for the Crowdfunding project on a blockchain layer.

Here we need to enter relevant information about the projects, all the details will be involved, the contract info and the specific instruction need to be followed. Terms and conditions can be separately part of it and can be mentioned as directed linked on these smart contracts as in real world contracts. Once the contract gets deployed and reaches confirmation level, it can be easily published and can be submitted for the further transactions to collect funds from different groups of investors.

2. Token mint process

This process can be defined as the publishing of specific tokens related to the fundraiser project using ERC-721 token standard. Initially published smart contracts will be the mirror for this process and the usage of smart contract will be in the heart of the project in minting process (Mudgil, 2021). The minting process will come with a certain price and some fee, once the payment part is completed the investors ownership gets approval on the blockchain and officially becomes the part of the fundraising. The main advantage of ERC-721 standard is it can't be modified or get disappeared in future, virtually it is an ever-living proof of ownership.

The beauty of the crowdfunding with non-fungible tokens is the smart contracts related to the fundraiser can also be defined as an investment contract. Because it carries the same values as a simple investment type. Also, the non-fungible tokens minted or acquired from the smart contracts directly can be easily defined as a security as it mentioned on the act by Securities and Exchange Commission v. W. J. Howey Co. (Securities and Exchange Commission v. Howey Co., 1946). Anything carries these features can be treated as a security:

- An investment of money
- In a common enterprise
- With the expectation of profits
- To come solely from the efforts of others.

3.2. Creation of Smart Contracts for the Crowdfunding Process.

A smart contract is an agreement that may be implemented instantly and must be carried out in line with the conditions of the contract. Smart Contracts can be operated automatically by a software, but some elements typically require human access and control. Can indeed be implemented both lawfully and by the incorporation of computer software that can't then be modified or authorized (Clack & Braine, 2016).

A smart contract is made up of a total balance, personalized storing, and program code. The status of the smart contract is maintained in a single interlinked unit and is refreshed each occasion the transaction is invoked. Just after transaction is made, the data in the ledger can hardly be reached. By submitting a transfer to a unique identifier Twenty bytes as from contract, the offer may be performed. Following that, the contract is performed by net miners to obtain consensus output, and the contract's validity is updated. Contracts may read and write activities to storing information, store money in their wallets, and read notifications or funds from other users, as well as create better agreements (PwC, 2017).

Smart Contract usage and its application on Blockchain system helps to boost the crowdfunding process in order to record transparently all the amount received and all the donations received exactly from which donors.

This is the sequence of deploying and executing a new fundraiser smart contract, carried in three main steps (Basu, et al., 2022):

1. Specification – Posting Transaction

- Founder ID (Hash Code) – This is a combination of unique wallet addresses, compiled of alphanumeric characters and mainly in length of 25-35 characters

- Name or Title of the Project – The launching name of the project for the community, can be edited or changed in the future.

- Description of the project – Short summary of the project to make it more understandable for the community, can be a few paragraphs as well.

- ID of the project – Also as Founder ID, a separate unique wallet address can be appointed.

- Conclusion Date – As all fundraiser projects, traditional or NFT based, the target date should be met among criteria.

- Maximum and Minimum Amount Required – It needs to be met on the smart contract that which amount is required in a minimum level to fulfill the crowdfunding process and the max amount where smart contract won't issue more NFTs, because of its limited nature.

- Shareholding – The percentages should be mentioned, basically the share of the founders and the investors involved in these projects.

2. Contribution by Backers

- Project and Founders IDs – This a crucial info for the backers to check the relevancy of the project before becoming a donor

- Token Supply – Because of the limited supply it needs to be publicly available for the backers that how many shares or tokens will eb distributed.

- ID of the backer – All backers need a valid wallet address in order to get a token from the project

3. Recording Stage – Once all the tokens are distributed and the fundraising amount is met, whole process is recorded and is available publicly.
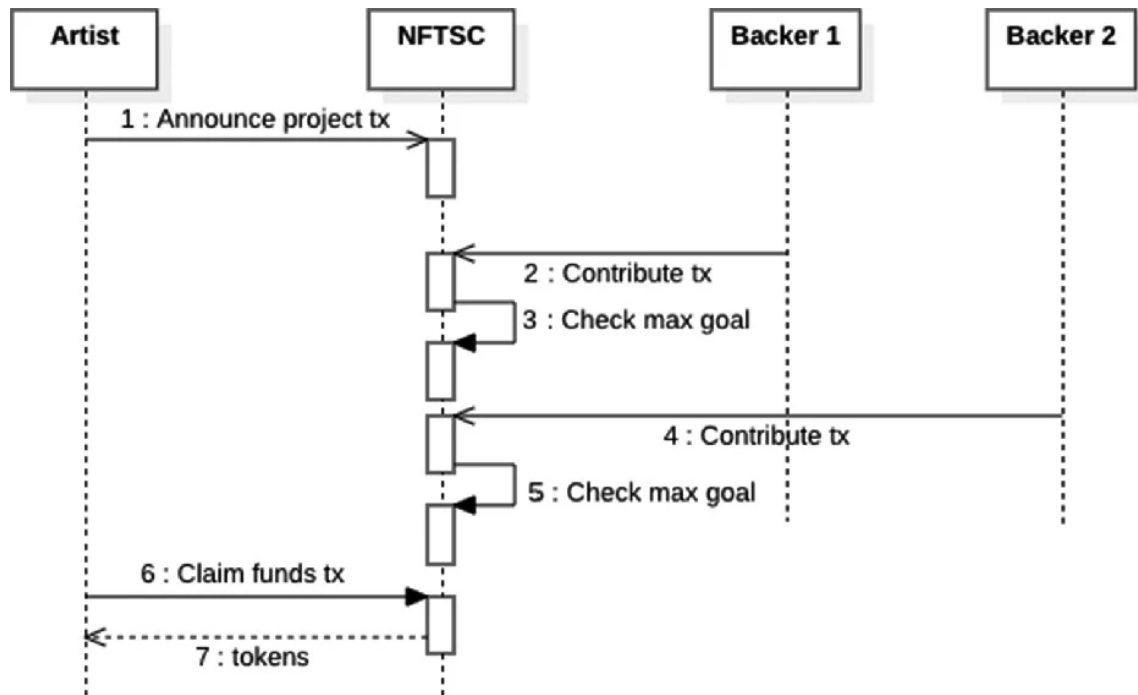
Figure 7. Crowdfunding sequence diagram [Source: (Basu, et al., 2022)]

3.3. Gamified Crowdfunding Model

Development stage has a huge dependence on the capitalization. Several project founders have used crowdfunding as the main initiative behind the capital formation in the early stages of their businesses. Main application of crowdfunding till today mainly used in video gaming industry, most of the funded projects on Kickstarter for example are video games (KickStarter, 2022). The main motive behind the focus on this area comes from the collective approach, mutual creativities and interaction for exploration collectively (Agogué, et al., 2013).

Gamification can be broadly used in finding solutions for capital formations as an alternative source of financing a project in an initial stage. This method's main fame comes from the application of gaming methods as a tool to increase the engagement of the users and it becomes the main motivation goal for the fundraisers. It is widely used in branding and community formation. Consumption in a simple level is the emergence of the community experiences and individual interests in the online projects and video games (Köhler, et al., 2011).

By the application of gamification in crowdfunding process, it basically enters into a newer level such as they are no longer just spectators in the project, but also engage as an investor, voter and the ones who take an active part in the information flow of the process among the processes and members. Merging the non-fungible token concept with the gamification of the crowdfunding with the help of blockchain technology all the boundaries disappear within the community.

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Gamification creates a strong set of the social behaviors and interactions among the fans of the projects, so this main motive drives them to be a part of the crowdfunding carried. And the approach mainly shifts to a branding of the fundraised project with giving special perks and avatars to the initial investors (Muñiz & O'Guinn, 2001).

3.4. Gamification of NFT Projects

Online or internet-based communities take an active part in the development process of the recent gamified NFT projects. Because of its online availability community members involved in the projects can have more access than a typical consumer (He, et al., 2016).

NFT communities are famous for the instant feedbacks in the process, such as immediate cycles of agile development and the team collaboration for the project acceleration stage (Rosas, et al., 2003). In the gamified universe and in gaming industry NFTs became so popular since 2021 and they're not only crypto actives in the wallet. These are systems where gaming techniques applied in order to keep the activities in track and boost interactions.

The confluence of gamification with NFTs offers organizations a one-of-a-kind, cutting-edge chance to engage existing clients while still recruiting new users. In reality, it amplifies the loyalty schemes. Using gamification notion into the account it can unlock a newer level in financial incentives and to boost the business models of the projects in pre-crowdfunding stage. It can widen the opportunities to build a more sustainable ecosystem in the alternative finance, in case of this research in crowdfunding process (Elliott & Wright, 2018).

Applying gamifying into the crowdfunding process, NFTs also assure several utilities to the users, which is one of the main factors in a simply gamified business model (DiegoGaraialde, et al., 2021). NFT projects carry several utilities for the investors who minted the limited tokens from the project smart contracts.

Meta Accesses to the projects carries tokenomics of the metaverse ecosystem. Tokens also can be passively earned through earning an NFT in the collection. Initial investors get unique access the gaming contents. Different rarity levels create different accesses also. Unlocking special groups or clubs in the metaverse which drives the community driven projects which affected by gamification. Several projects give fashion or merch items for the holders. Especially Governance models presented to the communities are the main focus of the gamified projects such as being a part of the decentralized ecosystem and where you have a voting right after getting verified.

3.5. Gamified Sales Method in the NFT Space – Dutch Auctions

Unified Dutch auctions (also known as Dutch auctions) are market structures wherein the price of something offered is established after taking into account all bids in order to arrive at the maximum price at which the entire offering can be sold. The sum of funds that investors are ready to spend in terms of both quantity and price is determined through this form of auction. A Dutch auction also refers to a sort of auction for which the cost of an item is dropped until it obtains a bid. In case of appointed amount is higher than the reserve one, the winning bid will be the one that is accepted and results in the sale of the property. The opposite of this is true in traditional auction markets, where the price begins low and gradually rises as bidders battle against one another to be the winning buyer.

According to the paper "Dutch Auction Repurchases", which is one of the first analysis and scientific papers made for Dutch Auctions area, applying this method creates a heterogeneous environment for the potential shareholders. In terms of an NFT collection one of the most important metrics is trade volumes. Applying Dutch model auction to this can increase total volume traded up 800% of the average expected volume. (Bagwell, 1992)

To participate in a Dutch auction Public Sale, potential investors must make their bids for the quantity of tokens they wish to purchase, together with the price they are ready to pay. A bid for 200 shares at $200 may be placed by one investor, while a bid for 1000 shares at $190 may be placed by another. Once all the offers are made, the allocated placing is allocated to the bidders from the top bids down, until all of the allotted shares are assigned. The amount that each bidder pays, on the other hand, is determined by the lowest price among all of the authorized bidders, which is effectively the final successful bid. If the last successful bid is $160 and you place a $200 bid for your 1,000 shares, you would only have to charge $160 for your 1,000 shares if the last successful bid is $160.

It can be characterized as both efficient and fair method, according to the paper by A.Anand about IPOs, where IPO is also one of the methods that follows same path as crowdfunding for a mass amount of fundraising. In Dutch Auctions investors have the independence and opportunity to choose a certain price based on the demand of the stock and there is no need for interaction with an investment bank and can do anything with his or her own preference. Going through the fairness part it is related directly to the philosophy of an NFT collection, because in these auctions everyone is equal and can acquire the same level of opportunity as everyone is going to participate. (Anand, 2005)

The most significant advantage of such auctions is that they are intended to democratize the process of public sales. Currently, investment banks have a significant amount of control over the process of launching a typical initial public offering (IPO). In this role, they act as underwriting to the offering and shepherd it through trade shows, allowing major investors to purchase stock in the issuing firm at a discount. They are also in charge of determining the minting price for the purpose

of public sale. A Dutch Auction allows small investors to participate in an offering by allowing them to bid on the shares.

A Dutch Auction is also designed to reduce the discrepancy between offering and actual listed prices. Institutional investors profit from this discrepancy by acquiring shares at a discount and then selling them immediately once the stock is listed on the stock exchange. Dutch Auction pricing are established through a more equitable and open process in which a diverse range of bids from various types of customers are welcomed. This method is intended to ensure that the market comes at a fair assessment of the firm's value and that the first "pop" that occurs when a hot business goes public is kept to a minimum.

As a result of the huge volume of transactions that occur during the public sale, the Ethereum network will impose hefty transaction fees on users who wish to add new blocks to the blockchain. Unfortunately, this tax is frequently more than anticipated, resulting in petrol wars and users being forced to pay outrageous gas prices. Consequently, when a customer pays for artwork at a higher gas price, the entire sum is distributed to the miners' coffers. (Art Blocks Community, 2022)

To re-direct excess minting fees from miners to artists or to fund specific charity or a community DAO, the Dutch auction approach is employed. Some collectors are enticed to spend more than the asking price for the artwork they seek as a result of this. Additionally, informing collectors that the price would progressively decline at a certain frequency finally redistributes the sales flow, reducing the frenzy to purchase at the time of debut.

3.6. Decentralized Autonomous Organization

The study of decentralized organizations of various forms is well-documented in the field of organization theory. However, the first references to true Decentralized Autonomous Organization (DAO) were in the 1990s, when they were used to describe multi-agent systems in a nonviolent decentralized action in the anti-globalization social movement as part of a coercive decentralized action (Schneider, 2014).

DAOs, on the other hand, have their origins in the older notion of a Decentralized Autonomous Corporation (DAC), which was created a few years after the invention of Bitcoin and has evolved into its current meaning. The term "decentralized autonomous companies" (DAC) was first used informally in early bitcoin groups and conversations, with the terms "decentralized" and "distributed" autonomous corporations being used interchangeably (Larimer, 2013). However, it was not until 2013 that the word began to be more extensively used and debated in public on a number of websites, including those run by the founder of Bitcoin Magazine, Vitalik Buterin, among others.

DAO's main goal is to adapt a certain rules and regulations for the fundraised project, with a simple approach decentralized autonomous organizations can serve for a certain mission or vision, to fulfill a mutual objective for the ongoing project (Aste, et al., 2017).

DAO model can also be considered as a stage that the members, so called the investors in this research according to the ERC-721 protocol. Where each token can stand as a right to vote in the organization (Voshmgir, 2019). Holders can participate in the process of proposing and they can also put forward the ideas for the project. As simple in any voting system, the higher percentage party gets the idea realized, in DAO models also voters can vote for the favor of the project where mutual interests are met. Instead of the traditional decision-making process by the board in a hierarchical level, DAO gives this feature to the current token holders (Sims, 2019).

These distinguishing elements of the DAO idea are included in the DAO concept:

- Decentralized autonomous organizations (DAOs) allow individuals to cooperate and self-govern themselves online.

Despite the fact that there is no mention of a minimum size for the group, the term "organization" is commonly understood to refer to an entity comprised of several individuals working together toward a shared objective, rather than a properly licensed organization, in this context.

- A DAO source code is deployed on a blockchain that supports smart contracts, such as Ethereum, and is, in most cases, a publicly accessible blockchain.

- The smart contract code for a DAO sets the rules for interaction between individuals. Although it is uncertain to what degree other governance processes may influence or overturn such a code, it is possible that they do so.

- Because these rules are created using smart contracts, they are self-executing and do not require the consent of the parties to be followed.

- The governance of the DAO should continue to be separate from central control.

- Because they operate on the blockchain, decentralized autonomous organizations (DAOs) acquire some of the characteristics of the blockchain, such as cryptographic security, transparency, and decentralization.

The holders of the tokens which firstly invested in an idea which is mutual interest for all of them on a financial level gain the opportunities in a crowded fund, like an investment in shares. Based on the price or the amount which is mentioned in the smart contract, holders acquire and NFT which will serve as a mean on gaining special rights in the decentralized autonomous organizations. Mostly they can use voting rights or these tokens will bring future benefits in the future period in monetary means. The innovative nature of DAOs give access to holders to get rid of the intermediaries, which this feature saves tons of money for the holders in the long-run (De Filippi & Hassan, 2016).
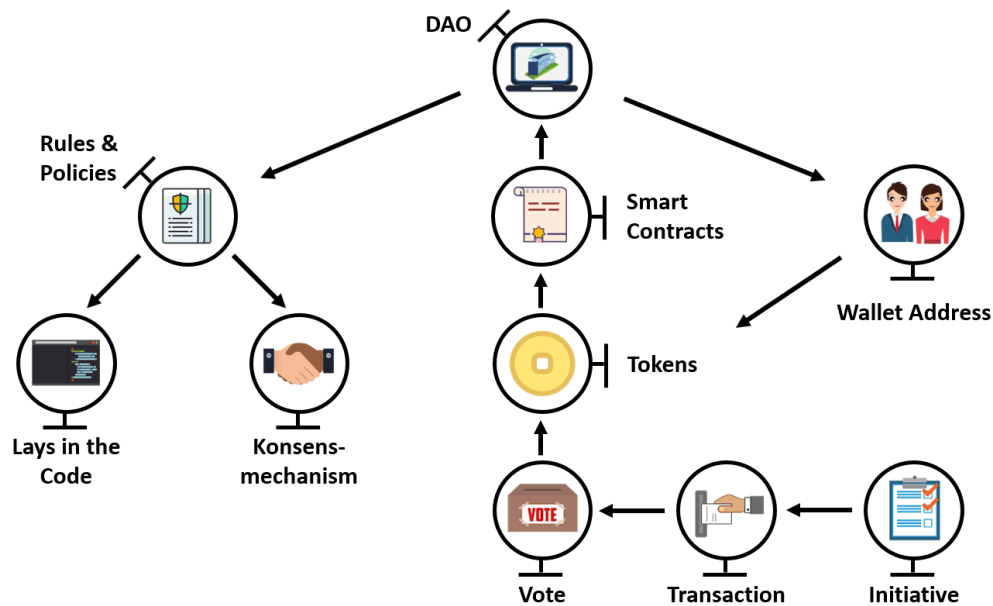
Figure 8: Decentralized autonomous organizations work mechanism [Source: Nirolution - What is a DAO? Decentralized Autonomous Organization Simply Explained! - 2018]

3.7. Protection of Intellectual Property Rights

NFT-based patent structure includes five main levels: Authentication Level, Storage Level, Verification Level, Blockchain Level, Application Level (Bamakan, et al., 2022).

Storage Level: There was a desire to bring more benefits to the technical world, hence decentralized storage networks were developed. The following are some of the advantages of utilizing decentralized storage systems explained: (1) By making effective use of present storage, it is possible to save money on costs. (2) Multiple copies of the data are maintained on separate nodes, so avoiding bottlenecks on central servers and speeding up downloads. Essentially, the infrastructure necessary for storage is provided by this base layer by omission. The goods on NFT platforms have distinguishing qualities that must be included in order for them to be identified.

Non-fungible token metadata is information that describes a specific token ID and is not fungible with other tokens. NFT metadata is either represented on-chain or off-chain, depending on the implementation. On-chain implies that the metadata is directly included into the NFT's smart contract, which represents the tokens, rather than through a middleman. Off-chain storage, on the other hand, refers to storing the metadata in a different location.

Blockchains give decentralization, but they are expensive to store data on and do not allow data to be withdrawn from the blockchain. A good example is that many projects' metadata is preserved off-chain due to the existing storage limitations and high maintenance costs associated with the Ethereum blockchain. Developers make use of the ERC721 Standard, which includes a technique known as tokenURI, to accomplish their goals. In order to inform programs about the location of metadata for a certain object, this mechanism has been created. At the moment, there are three options for off-chain storage: The InterPlanetary File System (IPFS), Pinata, and Filecoin, all of which are open source.

Authentication Level: Using the Decentralized Identity (DID) concept, individuals may acquire credentials from a range of issuers, such as the government, educational institutions, and employers, and store them in a digital wallet. The verifier then utilizes these credentials to validate the authenticity of a person's identification by following the "identity and access management (IAM)" procedure, which is implemented on a blockchain-based ledger. As a result, DID gives individuals the ability to maintain complete control over their identities. Intellectual property and copyright infringements are also caused by a lack of NFT verifiability; of course, the chain of custody may be tracked back to the creator's public address in order to determine whether a comparable patent application has been submitted using that address. However, there is currently no easy and surefire technique to determine the validity of an NFTs originator. An NFT that does not have this type of verification built in will only verify ownership over the NFT itself and nothing else.
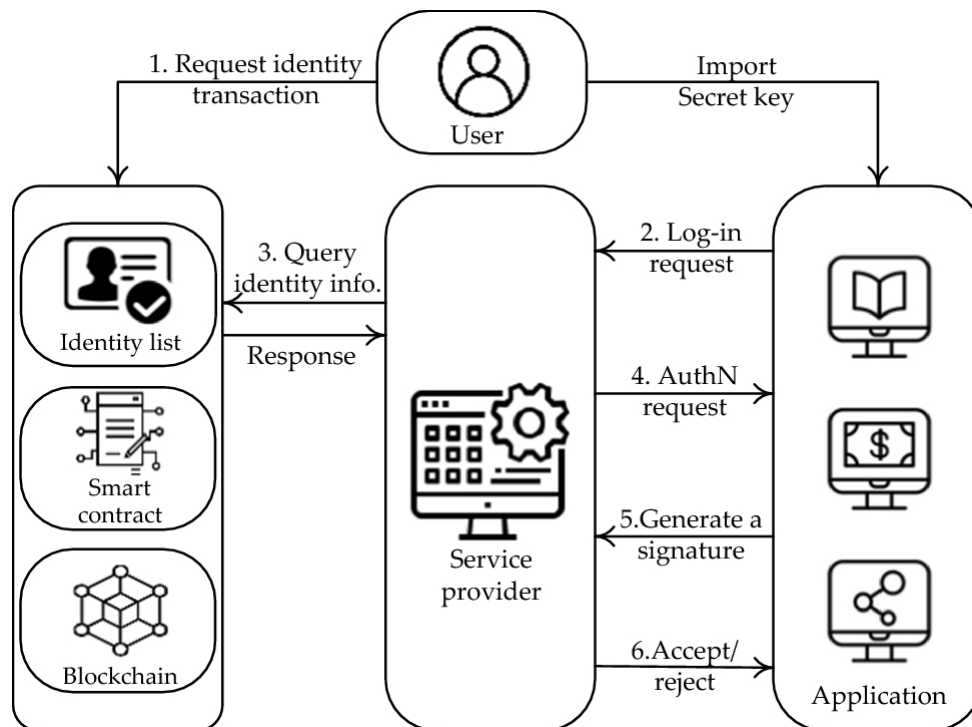
Figure 9: Decentralized Authentication. [Source: (Bamakan, et al., 2022)]

The suggested platform produces smart contracts that are connected to patents and operates as a software that runs on the blockchain in order to accept and submit transaction requests. When combined with a proper KYC procedure, they are unchangeable in terms of discreetly identifying clients (Martens, et al., 2017). Following clearance of the KYC process, an NFT will be issued on the blockchain as a certificate of verification. For authentication purposes, this paper makes use of a decentralized authentication system at this tier. This method has been used for a variety of blockchain-related applications (for example, smart cities, the Internet of Things, and so on), but we are using it for the suggested framework since it is simple and straightforward (patent as NFTs). Detailed information about this solution will be provided in the next section (Khalid, et al., 2020).

Blockchain level: When used in the patents as NFTs architecture, this layer serves as a middleware layer between the Verification Layer and the Application Layer. The primary function of the blockchain layer in the proposed architecture is to handle intellectual property rights. In our research, we discovered that switching to a blockchain-based patent as an NFTs records system allows many previously recommended enhancements to present patent systems to be implemented in a more flexible, scalable, and transparent manner. On the other side, we have the option of using a variety of blockchain systems, such as Ethereum, EOS, Flow, and Tezos.

Blockchain systems may be divided into two basic categories depending on their consensus mechanism: permissionless (public) Blockchains and permissioned (private) Blockchains. In a public blockchain, any node can join in the peer-to-peer network, resulting in a blockchain that is completely decentralized and completely open. An individual node can choose to quit a network without obtaining permission from other nodes in the network.

As the NFTs platform for creating blockchain intellectual property, the proposed patent will benefit the whole patent ecosystem. As a result of solving basic difficulties within the existing patent ecosystem, it is a solution that reduces obstacles. Patents and trademarks may be handled efficiently using blockchain technology, which reduces the amount of time necessary for clearance as well as the amount of other resources required. Creators, Patent Consumers, and Copyright Managing Entities are the three types of user entities that are involved in Intellectual Property management.

Patent creators, such as inventors, authors, and researchers, are those who have ownership of the original data that they use. Patent Consumers are consumers who are willing to consume the material and contribute to the creator's labor in exchange for a patent. The copyright management entities, such as attorneys, on the other hand, are the users who are responsible for preserving the intellectual property of the authors. The patents as non-transferable tokens (NFTs) solution for IP management on the blockchain layer is implemented by following the procedures outlined below (V.Helliar, et al., 2020).

Bitcoin is one of the most well-known instances of a public blockchain, and it is also one of the most widely used. Several consensus techniques are used in blockchains, including Proof of Work (POW), Proof of Stake (POS), and directed acyclic graph (DAG). The Proof-of-Work consensus process is used by Bitcoin and Ethereum, two well-known and reliable blockchain networks. Blockchain systems like as Cardano and EOS use the Proof-of-Stake consensus method (Casino, et al., 2019).

Application level: It is anticipated that the patent Platform Global Marketplace technology will enable many enterprises worldwide to tokenize patents as NFTs in order to develop an infrastructure for storing patent records on a blockchain-based network and developing a decentralized marketplace where patent holders could easily sell, license, or otherwise monetize their patents. Smart contracts can be used to calculate a defined price for a license or purchase under the terms of the NFTs-based patent.

Any buyer who is happy with the terms can pay and immediately unlock the rights to the patent without the need for either side to communicate directly with the other party. While patents are currently managed by different jurisdictions throughout the world, a blockchain-based patent marketplace based on NFTs can overcome the geographical boundaries between patent systems by employing a simple search query to find patents. The simplicity with which prospective inventors may get patents throughout the world might assist them in expediting the inventive process by building upon the patents of others and obtaining licenses to do so. For patent NFTs, there are several applications, including small and medium-sized enterprises (SMEs), Patent Organization, Grant & Funding, and fundraising/transfer of patent-related information. As time goes on, the number of applications for these tokens continues to rise, and we are continually discovering new methods to put them to use. The following are some of the most frequently utilized applications in the industry.

Patent ownership can be transferred through the use of non-transferable tokens (NFTs). To hunt down patent owners, the blockchain might be used in conjunction with tokens that would incorporate self-executing contracts that would transfer the legal rights connected with patents whenever the tokens were transferred. A collaboration between IBM and IPwe has pioneered the use of non-transferable tokens (NFTs) to guarantee patent ownership. Together, these two businesses are developing the foundation for a patent marketplace based on NFTs (near-field communication).

Furthermore, NFT-based patents may promote trustworthy information exchange across patent offices and patentees around the world, lowering the strain on examiners and, in some cases, potentially speeding up efforts to harmonize patents and standards around the world. Additionally, patents based on NFTs have extra transparency and archival features built in from the start. An invention patent should be considered a privilege reserved for those who undertake resource-intensive research to push the boundaries of technical capability. The public is very interested in the complete transparency of these prizes as a reward for their accomplishments. In

today's systems, it is society that bears the cost of the administrative and economic inefficiencies. Patents based on NFTs have the potential to increase transparency. The use of an NFT-based patent, from an organizational standpoint, can alleviate present bottlenecks in the patent application process by making the application process more efficient, quick, and comfortable for applicants while not sacrificing the quality of patents issued.
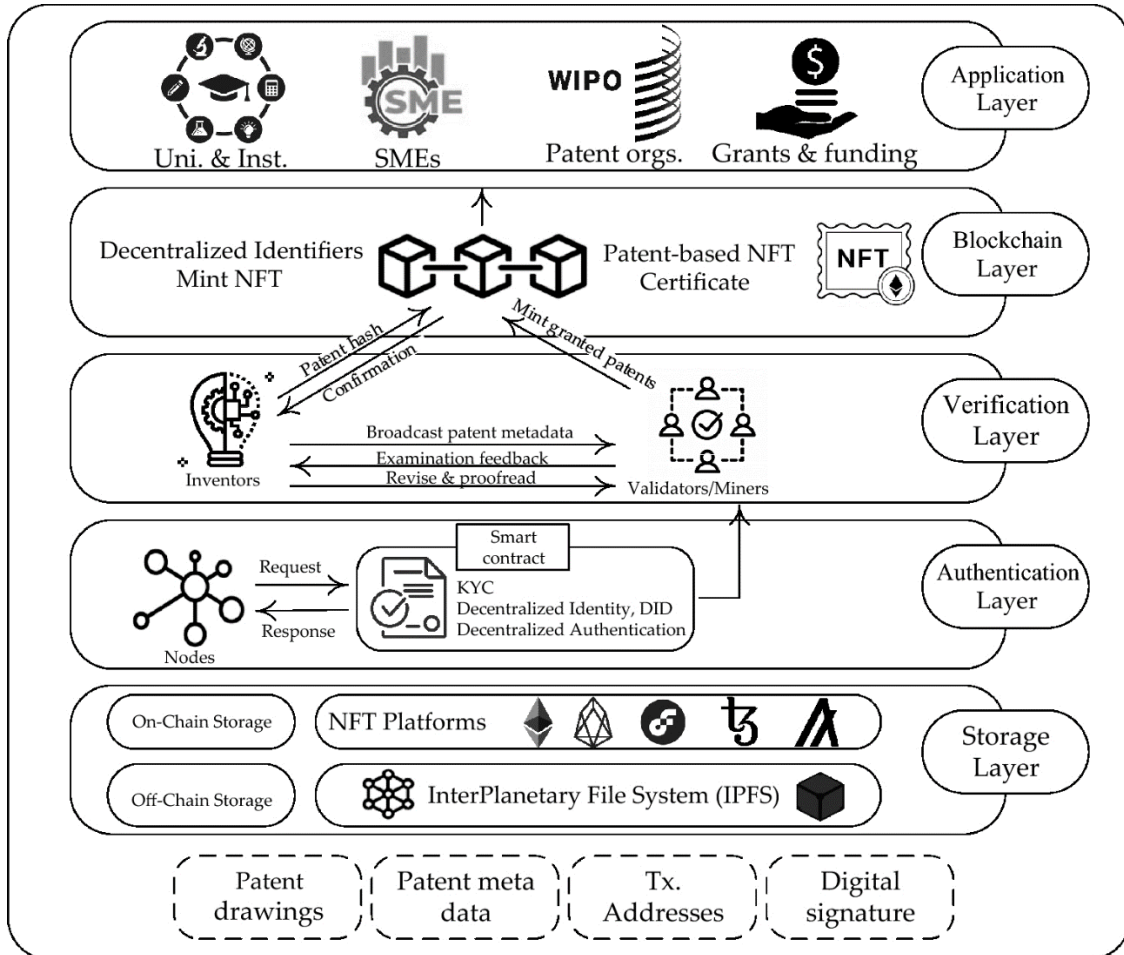
Figure 10: Structure of an NFT-based patent. [(Bamakan, et al., 2022)]

The suggested architecture confronts various difficulties that must be overcome in order to establish a fully functional patent verification platform. First and foremost, technological issues are tackled. This section does not go into depth on the consensus mechanism that is employed at the verification layer. It is possible to use consensus algorithms built for permissioned blockchains, such as PBFT, Federated Consensus, and Round Robin Consensus, because of the permissioned structure of miners in NFT-based systems. Furthermore, miners and validators spend a significant amount of time validating patents; as a result, a protocol should be built to benefit them. Some difficulties, such as demonstrating the miners' time and effort, determining the amount that inventors should pay to miners, and other economic trade-offs, should be taken into consideration.

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CHAPTER 4. METHODOLODY

4.1. Hypothesizes – Research Conduction Base

H1 – Crowdfunding which is conducted via NFT technology is more efficient and instant for both investors and project founders than traditional financing.

According to the literature review, publications indicate that the nature of crowdfunding which is conducted by NFTs has a unique approach in terms of privacy and mobility. The whole process is carried via smart contracts and the ERC-721 protocol (Mudgil, 2021). The costs are lower than a traditional crowdfunding and because of the gamified nature of NFT projects (DiegoGaraialde, et al., 2021) they more likely have the ability to collect more amount in funds than a traditional one, in this research the author will back up the idea with numbers.

Here we will compare the projects gets crowdfunding on Kickstarter.com – which is one of the biggest crowdfunding platforms in the world right now. Also, the fund raised for an exact NFT project within its own platform via a smart contract developed by the team itself will be shown.

Main target to prove this hypothesis we will analyze both crowdfunding methods; backing up a project through Kickstarter Platform & Issuing tokens for the future NFT holder. Top 15 projects for both models will be listed and the objective is to find which way is more efficient to raise $ 1 million in USD with less backers. Also, from the item of "cost per backer" we can see in which type of crowdfunding model people more likely get involved in.

Median amounts of two fundraising methods will be compared showing the difference between the duration to one-million-dollar fund raised during crowdfunding period, average investment needed from each investor in order to realize the project in a promised period of time and present it to the audience.

H2 – Gamification of fundraising process seems more attractive for the investors. The community psychology backs up the project and keeps the per token price more stable in the long-run than a usual company, so the gain is more than an average publicly listed company share.

This hypothesis emerged after reviewing several publications and there's a certain link between NFT projects' gamified model and the interest in them, as it obviously affects behaviors of the investors psychologically (Elliott & Wright, 2018). Rather than a typical share of the company NFT projects are most likely driven by the common incentives and interests, and this motive is somehow more important than a simple commercial interest. The community logic and the mutual support of the projects increases the per-item price in the long-run growingly and community is more attracted to support the project by any means. The returns on initial investments will be given in order to prove the traditional and non-fungible tokenized corporate models and the author will back up the idea with the certain numbers and calculations.

In order to prove this hypothesis statement in this paper a traditional IPO model and NFT issuing models will be compared, in other words gamified investment model will be compared with the traditional fundraising process. As the blockchain data is fully public the transactions can be tracked. The data is available on eterscan.io. For the exact comparing two case models (in this case a startup and an NFT project) will be presented and we can see the periodical changes of a project. As listed companies can be traded easily in the stock market, the secondary market sales and opening/closing price per share will be used chronologically. Same as a listed pubic company, NFT projects can be listed in the market places and are open to be traded in the secondary markets. For the company case study share price of a company will be analyzed, consequently for the NFT project floor price term stands for the price per token (like price per share).

Company Shares data will be extracted from the database of NASDAQ Global Select Market Composite (NQGS), where public tech companies get listed and be traded easily.

NFT Floor Prices data will be extracted from OpenSea.io as the biggest secondary market for the NFT projects. For both sides historical data will be used, and as a core focus mainly the progress within the first year of getting will be compared.

Return on investment (ROI) logic is the same for anything which gets an exact amount of initial investment. So, the gain of an NFT project vs a company will be compared in this paper. It can be easily seen that which kind of investment can get more return and at the end it will be displayed with a table showing the coefficient marked as "X" also be shown in percentage.

4.2. Data and Sample

For "H1 – Crowdfunding which is conducted via NFT technology is more efficient and instant for both investors and project founders than traditional financing."

15 top Kickstarter projects will be used which raised an amount between 5-10 million in USD. For the NFT projects 15 of some top projects will be used and the period from the start of public sale to sold out phase will be compared with the traditional campaigns. Totally 30 projects will be compared with different amounts raised within different timeframes.

For "*H2 – Gamification of fundraising process seems more attractive for the investors. The community psychology backs up the project and keeps the per token price more stable in the long-run than a usual company.*"

Top S&P 500 companies such as Facebook, Amazon, Tesla and etc. will be used as case studies. Starting back on the IPO date till today, we will see what kind of gain does a usual investor made.

4.3. Definitions and Variables

Duration in days: This is the deadline set in order to fulfill the fundraising and within this period projects need to get fully funded for 100% success rate. As confident projects set a shorter period, each business has its own business model and approach.

Backer: Backers are those who make financial commitments to assist artists in bringing initiatives to fruition. Kickstarter is not a store; instead, funders contribute to the creation of new work. Simply said, your target audience is the group of people who are most likely to support your project and contribute to it. They have a number of qualities in common, such as comparable demographic profiles or interests. They'll also be experiencing some of the same difficulties. Your ideal supporter profile will consist of a combination of demographic information (quantifiable qualities such as location and age) and psychographic information (qualifiable traits such as gender and sexual orientation) (qualitative characteristics such as values, opinions, and hobbies). It is possible that the information you want will differ slightly based on your project, but the questions that follow should serve as a good starting point.

Total Raised: This section shows the total pledged money within a limited time period, so project creators or founders can raise as much money they can during this period. The amounts are displayed in USD currency. Thought for the NFT projects they raise the total amount in cryptocurrency, all of them in Ethereum (ETH), they are converted into USD amount. Which is fixated to the daily ETH/USD value of the crypto exchanges.

Cost Per Backer: This is the average amount each individual invested in a certain project. The amounts are displayed in USD currency.

ROI coefficient: Investment return, often known as return on investment shortly ROI, is an arithmetic equation that investors can use it in order to evaluate their investments and determine how well a certain investment has fared in comparison to other investments. Return on investment calculations are often used in conjunction with other methodologies to establish a business case for a specific proposition. The total return on investment (ROI) for a particular investment is used to assess how well that investment performs over the long term. (*ROI = Investment Gain / Investment Base*).

CHAPTER 5. DISCUSSIONS & RESULTS

H1 – Crowdfunding which is conducted via NFT technology is more efficient and instant for both investors and project founders than traditional financing.

Project Name	Duration in days	Backers	Total Raised	Cost per backer	Duration to $ 1 mln / Days	Backers Needed per $ 1 mln
Coolest Cooler (2014)	53	62,642	$ 13,285,226	$ 212.08	3.99	4,715
Frosthave (2020)	31	83,193	$ 12,969,608	$ 155.90	2.39	6,414
Pebble 2 (2016)	37	66,673	$ 12,779,843	$ 191.68	2.90	5,217
Kingdom Death (2017)	44	19,264	$ 12,393,139	$ 643.33	3.55	1,554
Travel Tripod (2019)	59	27,168	$ 12,143,435	$ 446.98	4.86	2,237
Critical Role (2019)	46	88,887	$ 11,385,449	$ 128.09	4.04	7,807
Pebble Time (2015)	37	78,471	$ 10,266,845	$ 130.84	3.60	7,643
Pebble: E-Paper Watch	37	78,471	$ 10,266,845	$ 130.84	3.60	7,643
BauBax (2015)	58	44,949	$ 9,192,055	$ 204.50	6.31	4,890
Modular Gaming Table	60	7,713	$ 8,808,136	$ 1,141.99	6.81	876
Exploding Kittens (2015)	31	219,382	$ 8,782,571	$ 40.03	3.53	24,979
Ouya (2012)	31	63,416	$ 8,596,474	$ 135.56	3.61	7,377
Snapmaker 2.0: 3D Printers (2019)	30	7,388	$ 7,850,866	$ 1,062.65	3.82	941
THE 7th CONTINENT - 2017	23	43,733	$ 7,072,757	$ 161.73	3.25	6,183
Median	37	63,029	$ 10,266,845	$ 176.70	3.60	5,700

Table 1: Top Kickstarter Projects, and the duration of their paths to one million [Source: Made by author- Used date from Kickstarter.com]

In order to prove this hypothesis top 15 NFT projects and top 15 Crowdfunded projects on Kickstarter platform (Statista Research Department, 2021) are compared. Range for the crowdfunded project vary between 7mln to 13mln, Coolest Cooler idea on top.

Pooling these sample projects in a table, it can be derived from this table that a traditionally crowdfunded project takes up to a month and even more on average. Mainly in these backed projects the idea is more complex and it need more time and amount to realize it. Most funded project categories on a traiditional crowdfunding platform are product designs, table top games and video games.

Realizatoin of the fully funded project takes from three months up to a few years in Kicktarter projects. According to their official stats average success rate(calculated by dividing the number

of successfully funded projects by the number of all projects that have reached their deadlines, including both unsuccessful and successful projects, even suspended ones.) funded through Kickstarter is 39,62 %. Success rates of design and game categories are 40,59 % and 45,04 % appropriately (Kickstarter, 2022). Despite the fact that the majority of successfully financed projects generate just under $10,000, an increasing number of them are raising six, seven, and even eight figures.

Programs that are currently receiving financing but have not yet achieved their objectives are not included in this chart; only projects that have received all of their financing are included. In more ways than one, funding on Kickstarter is all-or-nothing in terms of success. While 10 percent of initiatives completed without receiving a single contribution, 78 percent of projects that achieved more than 20 percent of their target were successful in raising the remainder of their funding.
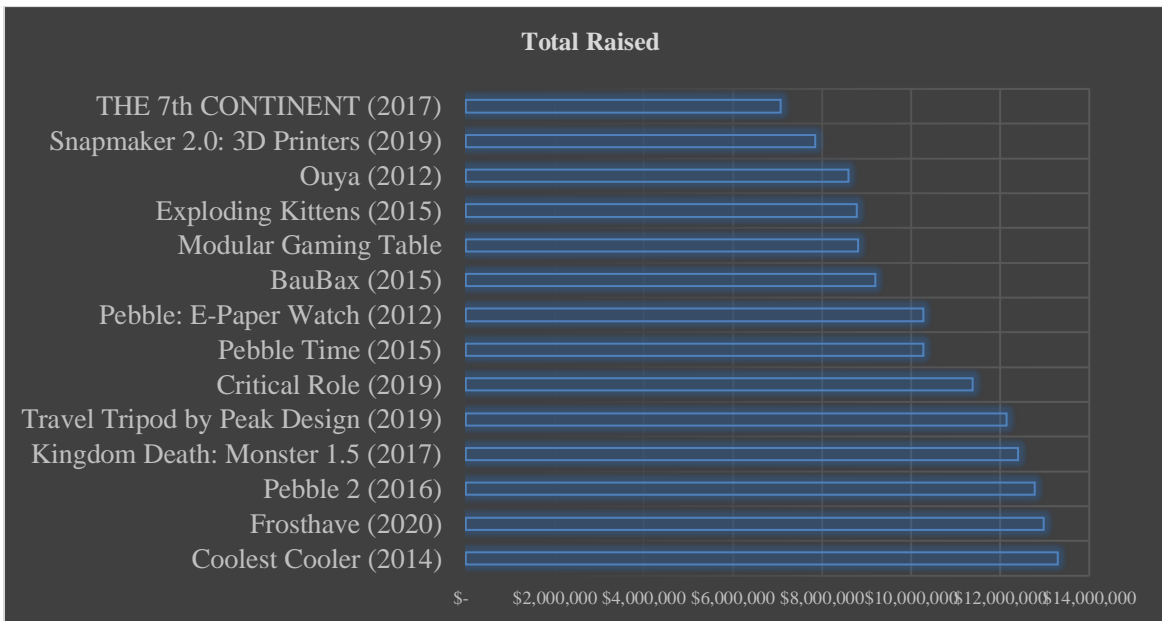
Figure 11: Top Kickstarter Projects [Source: *Statista Research Department*]

Backer of a Kickstarter project tends to spend less than 200 dollars roughly. When a company's market value, as defined by its outstanding shares and debt, and the replacement cost of its assets are taken into account, investment expenditure is minimal. Tobin's Q" was coined by the late James Tobin, who originally proposed the link between investment and this ratio. Q (the market value of a corporation divided by the replacement cost of its assets) has risen recently, yet investment has remained low (Wilbur G.Lewellen, 1997).

| Project Name	Duration in days	Backers	Total Raised	Cost per bakcer	Duration to $ 1 Million / Days	Backers Needed per $ 1 mln
Bored Ape Yacht Club	0.5	6,400	$ 1,900,000	$ 296.88	0.2632	3,368
Azuki	0.002	5,500	$ 29,000,000	$ 5,272.73	0.0001	190
Doodles	0.5	4,600	$ 4,765,000	$ 1,035.87	0.1049	965
CrypToadz by Gremplin	0.006	4,000	$ 1,689,000	$ 422.25	0.0036	2,368
World of Women	3	5,300	$ 1,608,000	$ 303.40	1.8657	3,296
Pudgy Penguins	0.208	4,400	$ 2,500,000	$ 568.18	0.0832	1,760
Invisible Friends	1	4,100	$ 3,455,000	$ 842.68	0.2894	1,187
Karafuru	0.04	3,700	$ 3,341,000	$ 902.97	0.0125	1,107
Hashmasks	4.00	5,100	$ 9,000,000	$ 1,764.71	0.4444	567
0N1 Force	0.003	4,300	$ 1,930,000	$ 448.84	0.0018	2,228
Mekaverse	0.83	4,800	$ 6,384,000	$ 1,330.00	0.1305	752
Lazy Lions	0.21	5,100	$ 1,500,000	$ 294.12	0.1387	3,400
PhantaBear	0.03	5,200	$ 10,000,000	$ 1,923.08	0.0027	520
Prime Ape Planet PAP	0.03	5,600	$ 7,580,000	$ 1,353.57	0.0037	739
Creepz Genesis	0.04	368	$ 2,620,000.00	$ 7,119.57	0.0159	140
Median	0.21	4,800	$ 3,341,000.00	$ 902.97	0.0832	1,107

Table 2: Top NFT Projects, and the duration of their paths to one million [Source: Made by author- Used data on Opensea.com and Offical Project Websites & Yahoo Finance to track daily ETH prices]

Main findings about top NFT projects table is that all these projects sold out their items included in the collection in a day, even less. During one fifth of 24 hours, in other words in 4.8 hours roughly. Some of the following projects above fully crowdfunded in a few minutes, including Azuki, CrypToadz and 0N1 Force, three, nine and five minutes respectively.

NFT projects tend to collect less money than an average Kickstarter project, though it looks like Kickstarter can be more beneficial and profitable, NFT projects stands for a unique item in the collection. Can represent a share in the project, has intellectual property rights and can generate income rather than a typical crowdfunded project. In the long run NFT projects is run by the DAO itself and has a specific market value, can be traded in NFT exchange marketplaces designed for the secondary sales, which is not so possible for the traditionally funded projects.

As mentioned above NFT project founders demand less than a Kickstarter projet but they tend to become a brand rather than other projects. Just a short example, Bored Ape Yacht Club raised less than two millions. But the market value as brand is $ 3.2 billion roughly by the date of 12th of April (CoinGecko, 2022).

An average NFT project achieves one million dollar target in less than two hours, for reaching this target they need five times less backers involved in these projects.
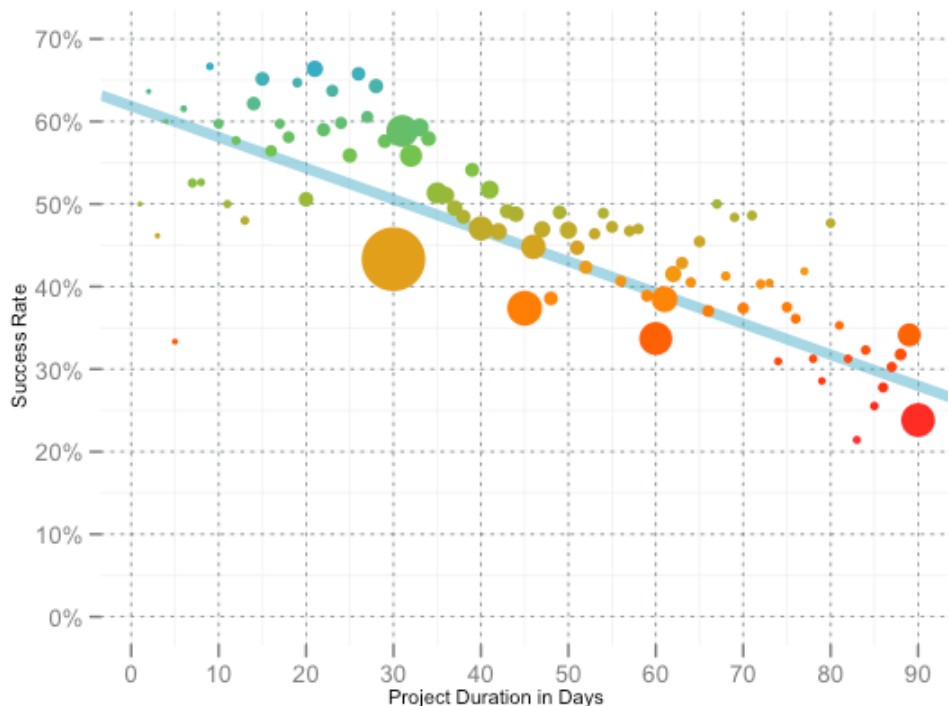
Figure 12: Project Duration vs. Success Rate [Source: Shortening the Maximum Project Length – KickStarter.com - 2011**]**

As the deadline approaches, the time length grows longer, yet more time does not imply more urgency. But it just serves to make it easier for supporters to postpone, with the result that many of them never return at all. Adding more time to the project's development is also counterproductive. Despite the fact that the financing deadline may appear to be a project's adversary, it is actually its ally (more on that in a second). Also, don't underestimate the amount of time and work a project will demand. Even for a creator, even little periods of time may be exhausting.

According to the statistics of the Kickstarter itself as long as the time period increases it has an opposite effect in success rate (Strickler, 2021).

The horizontal axis reflects the length of time that a creator picked for their project's duration, while the vertical axis represents the proportion of projects that were successfully financed by the creators themselves. As the line across the middle of the graph illustrates, historically, the more time a project has allowed itself, the less likely it has been to achieve its aim in the end.

Therefore, the primary function of longer-term programs is to widen the trough. A more compacted time-frame eliminates the sluggish weeks and focuses greater emphasis on the beginning and finish of the course. A project has a built-in momentum that propels it forward and keeps backers motivated and involved. It is hoped that shorter durations would allow for more initiatives to benefit from the same expertise.

H2 – Gamification of fundraising process seems more attractive for the investors. The community psychology backs up the project and keeps the per token price growing in the long-run than a usual company, so the gain is more than an average publicly listed company share.

There are certain objectives which can be achieved only via application of non-fungible tokens:

1. Ever-living digital storage and exchange records which will be kept on the blockchain. Financial records can be damaged or can disappear, but with the decentralized system all the data will be kept safe and public.

2. NFT technology gives opportunity to the shareholders to participate in the secondary market exchanges. Liquidation possibility is easier than traditional system. Like a Cart-to-card banking experience the following NFT can be easily transferred from one wallet to another.

3. NFT technology give access to the holders for the tremendous facilities. Independence is unlimited in this market. Decentralized system is in the core of this notion. Blockchain environment can be characterized as more secure place for the investors, it is accessibility of resources is available for everyone and data authenticity prevent the access illegitimate usage as each wallet address is unique and can be accessed with seed phrases.

4. The integrated system can validate the ownership; it can be easily tracked at any time. The changes occur real-time and can be verifiable with a few steps. There is no need for any manual interaction for transactions, as it is automated already with the help of smart contracts, and a verified one can show the investor all the details with a simple way. Because of this automation the initial costs are lower than an average IPO process and token issuing is economically beneficial from both the investor side of view and fundraiser.

The ownership of a sole digital asset such as a video clip, recording, or crypted artwork is evidenced by the presence of an NFT. The blockchain is where these digital receipts are stored (a digital ledger). Following the "minting" of an NFT, which involves having its code enduringly intertwined into the blockchain's DNA-like digital components, so called meta data of an NFT, it may be purchased or sold using a digital currency, currently Ethereum. Earlier this year, an artist going by the name of Beeple auctioned off a mosaic of digital photographs as a non-traditional work of art that brought in the equivalent of more than $69 million (Kastrenakes, 2021).

Purchasing one of these digital receipts is a great way to demonstrate to the creator of a piece of cyber art that you appreciate their concept and are willing to contribute financially to their cause. The majority of the time, the value of the NFT is derived from the sense of accomplishment that comes with having one's name linked with a work of cyber art. A collected asset is thus created as a result of this circumstance. As a result of technological improvements, the conventional idea of the art market has been flipped on its head, with value being attributed to

artworks that are readily available rather than those that are in limited supply. Therefore, non-financial entities have significantly enlarged the market for digital art forms, which have traditionally not been considered as highly as physical paintings and exhibits in the traditional sense of the term. (Humphries, 2021).

Comparing NFT funded projects with the traditional ones, investors can gain more control and as access to vote in the process, DAO model stands in the heart of this statement:

DAO	Traditional organization
Usually flat and entirely democratic, as is the case at the moment	Has a usual hierarchical governance
Any changes that are implemented must be approved by a majority of the membership.	A single party can demand changes, or a vote may be offered, depending on the structure of the system in question.
There is no trusted intermediary in this process, and the results are applied automatically.	The votes are tabulated internally, and the results of the voting must be handled manually if voting is permitted.
A decentralized approach is used to handle the services that are being delivered (for example distribution of philanthropic funds).	Handling by humans or centrally controlled automation is required; nonetheless, it is susceptible to manipulation.
Every aspect of the operation is transparent and open to the public.	Typically, activity takes place in a private setting and is not open to the general public.

Table 3: Key differences between traditional and DAO models [Source: Made by the author]
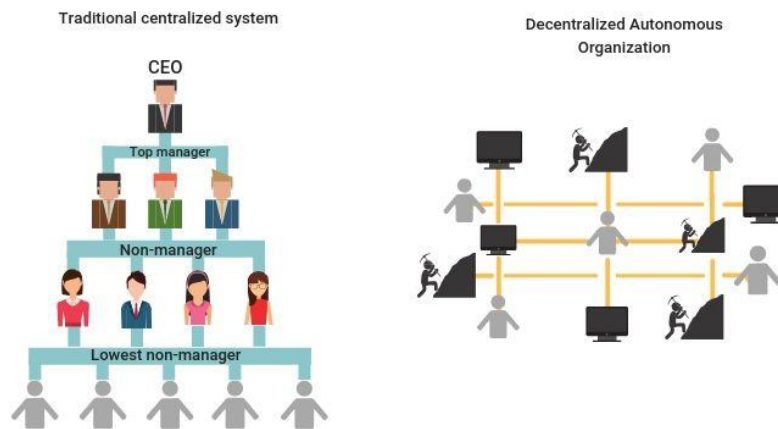
Figure 13: Comparison between DAO and Traditional Model

Project	Initial Investment Amount	Current Amount in $ (Fixed to 4/11/2022)	ROI Coefficient	ROI in %	Duration in years
Bored Ape Yacht Club	$ 190.00	$ 354,352	1865.0 X	186501%	1.1
Azuki	$ 2,900.00	$ 77,415	26.7 X	2669%	0.3
Doodles	$ 476.50	$ 47,885	100.5 X	10049%	0.4
CrypToadz by Gremplin	$ 241.29	$ 8,300	34.4 X	3440%	0.6
World of Women	$ 160.80	$ 26,752	166.4 X	16637%	0.6
Pudgy Penguins	$ 280.90	$ 8,141	29.0 X	2898%	0.8
Invisible Friends	$ 691.00	$ 20,112	29.1 X	2911%	0.3
Karafuru	$ 596.61	$ 8,556	14.3 X	1434%	0.3
Hashmasks	$ 548.78	$ 1,564	2.9 X	285%	1.3
Median	$ 476.50	$ 20,112	29.1 X	2911%	0.6
Stan. Deviation	$ 855.53	$ 112,469	607.1 X	60706%	0.4

Table 4: Comparison of the initial and current values of top NFT projects [Source: Made by author- Used data on Opensea.com and Offical Project Websites & Yahoo Finance to track daily ETH prices]

Top 10 NFT projects sampled in this table in order to give an overview of the investment value in non-fungible tokens. In the previous hypothesis it can be witnessed that crowdfunding conducted through NFTs creates more interest in investors, so called backers. So, an NFT project and its items, also can be thought as a share from a specific project can be consumed fully in a few minutes or hours.

Gamified approach in crowdfunding, such as giving shareholders digital characters or avatars in the projects they got involved in make them invest more in the project than a usual stock price in a S&P 500 companies. Both shares or non-fungible tokens can represent ownership and should be taken into account as assets, or even a wealth generating tool. Initial amounts of NFT investments tend to increase in the following months, because the community logic drives the share price higher in this scenario. Individuality aids in establishing one's place in a group. It is important to have a good reputation. Sociocultural activity is fundamentally based on the ranking of persons within a hierarchy, and patterns of consumer behavior have historically been closely matched with these social assessments. It is for this reason that people buy Lamborghinis and Birkins. This intuition was used by BAYC in their NFT, which provided an electronic channel for owners to communicate their status.

According to Maslow's hierarchy of wants, humans' natural need to belong was put just behind fundamental desires such as hunger satisfaction in the order of importance. A Bored Ape NFT indicates your affiliation in the Bored Ape Yacht Club, a mass movement in which like-

minded individuals may assemble as part of an overarching, exclusive experience that only a small number of people can comprehend (Maslow, 1943).

Company	Initial Share Price	Current Amount in $ (Fixed to 4/11/2022)	ROI Coefficient	ROI in %	Duration in years
Apple Inc.	$ 22.00	$ 169.79	7.7 X	772%	42
Microsoft Corporation	$ 21.00	$ 296.34	14.1 X	1411%	36
Amazon.com Inc.	$ 18.00	$ 3,082.06	171.2 X	17123%	25
Tesla Inc	$ 17.00	$ 1,022.11	60.1 X	6012%	12
Alphabet Inc. Class A	$ 85.00	$ 2,662.00	31.3 X	3132%	24
NVIDIA Corporation	$ 12.00	$ 230.55	19.2 X	1921%	23
Meta Platforms Inc. Class A	$ 38.00	$ 222.00	5.8 X	584%	10
Johnson & Johnson	$ 37.50	$ 182.09	4.9 X	486%	28
Procter & Gamble Company	$ 100.00	$ 160.10	1.6 X	160%	44
Median	$ 22.00	$ 231	14.1 X	1411%	25.0
Stan. Deviation	$ 31.83	$ 1,159	54.2 X	5421%	11.9

Table 5: Comparison of the initial and current share prices of top S&P 500 Companies. [Made by author- Used data on Opensea.com and Offical Project Websites & Yahoo Finance to displaey historical stock price data]

This table displays top 10 S&P 500 companies their initial share price announced for the IPO process. We can see the IPO shares prices of companies such as Apple, Facebook, Microsoft, Amazon, Tesla, Google, NVIDIA appropriately, and their current share prices we are fixated to 4th of April, derived from the NASDAQ database. During whole these years investors in these companies gained returns on their investments for sure. As a mean value an average investor who made an investment basket from these S&P 500 companies gained 1411% Return on Investment. But the main indicator here is the duration. The investor achieved these goals in 25 years approximately.

Comparing gamified fundraising process with the traditional Initial Public Offering model, non-fungible token projects gain double return on investment compared to S&P 500 share investment. But they could achieve this massive gain in less than a year. With a median 2911% gain from the initial investment made a few months ago in public sales, NFT project items continuously raise and enables early investors make tremendous amounts in return.

CHAPTER 6. CONCLUSION

Main findings according to "**H1 –** Crowdfunding which is conducted via NFT technology is more efficient and instant for both investors and project founders than traditional financing.":

NFT initiatives tend to raise less money than the average Kickstarter project; yet, while Kickstarter appears to be more useful and successful, NFT projects beat them in speed as they are more instant in crowdfunding, also an average NFT project achieves a one million dollar target in less than two hours, for reaching this target they need five times fewer backers involved in these projects. NFT projects represent a one-of-a-kind item in the collection as they are more unique than a typical Kickstarter project. Rather than a conventional crowdfunded project, it might represent a share in the initiative, has intellectual property rights, and can create money. In the long term, NFT projects that are managed by the DAO and have a specified market value can be exchanged in NFT exchange marketplaces created for secondary sales, which is not allowed for conventionally financed projects. As previously said, NFT project founders expect less than a Kickstarter project, but they are more likely to create a brand than other projects. As long as the time period increases it has an opposite effect on success rate of Kickstarter projects, which makes NFTs a concrete champion in this race.

The time lengthens as the deadline approaches, yet more time does not indicate more urgency. However, it just helps to make it simpler for supporters to postpone, resulting in many of them never returning at all. Adding extra time to the development of the project is likewise unhelpful.

Main findings **for H2 – "**Gamification of fundraising process seems more attractive for the investors.":

Gamified approaches to crowdfunding, such as providing shareholders with digital characters or avatars in the projects in which they are participating, encourage shareholders to spend more in the project than a typical stock price of a company. Shares or non-fungible tokens may both reflect ownership and should be considered assets or even a wealth generation mechanism. Because the community logic drives the share price higher in this situation, initial quantities of NFT investments tend to rise in the coming months. Individuality helps one find one's position in a group. It is critical to maintain a good reputation. Sociocultural activity is basically founded on the rating of individuals within a hierarchy, and consumer behavior patterns have historically been strongly correlated with these social judgments.

When gamified fundraising is compared to the traditional Initial Public Offering model, non-fungible token ventures achieve a return on investment that is double that of an S&P 500 share investment. They might, however, accomplish this tremendous increase in less than a year. With a typical 2911 percent increase from the first investment made a few months ago in public sales, NFT project items continue to rise, allowing early investors to profit handsomely.

Question No. 1: What is a Non-Fungible token and why is it important for the future world?

The following are examples of digital assets that are modeled by real-world items, such as NFTs: artwork, music, in-game merchandise, and films It is most common for them to be acquired and sold online, frequently in exchange for other digital currencies, and they are generally encoded using the same root mean as many other digital currencies as well. Because a non-financial transaction allows the buyer to keep ownership of the original object, this type of transaction is preferred. In the blockchain, which is a decentralized public ledger that keeps track of all transactions, NFTs are kept. That's not all, though; it also comes with built-in verification, which may be used to prove proof of ownership if necessary.

It is nearly as valuable as the object itself to collectors for them to have those "digital bragging rights." NFTs are a technical conduit that allows any system to bundle together all of the vital information that it wishes to deliver to the community in an aesthetically pleasant manner in an aesthetically acceptable manner. NFTs serve as a gateway, a currency, an identity, and an investment vehicle for Web3, all in one package.

According to empirical evidence, the relationship between non-financial tokens and financial activity is a new phenomenon. On blockchain networks, NFT liquefication and trade have previously been witnessed in respect to the actual assets, such as gold. In the economic mainstream, non-financial products such as tangible art have long been recognized as having market worth as well as intrinsic value in terms of its artistic accomplishment features and social value/heritage features, as well as investment value. Because of technological improvements, it is now feasible to create and display art and artifacts in a digital environment.

Marketplaces enabled by smart contracts have worldwide reach and allow access to quick commerce for both the purchase and sell sides, while blockchain technology raises the possibility of peer-to-peer trades. Both of these advances have the potential to significantly alter the options for monetizing the commodity in non-financial things that have been made susceptible to digital representation in a significant manner. It is possible that we will reach a stage of 'financialization' of commodities in the crypto-economy when monetization channels, interfaces, and possibilities become scaled in the crypto-economy for nonfinancial products. There is considerable interest in integrating NFTs with DeFi, which is a collective name referring to multiple sorts of peer-to-peer financial innovations that are reportedly not engaging financial intermediaries, or at the very minimum the existing ones, according to the definition. At this moment, there is no official or systematic regulatory categorization or expansion of this domain in the United States. There is also a desire to link non-financial institutions (NFTs) with traditional financial services and operations.

Question No. 2: What are the main benefits and features of using NFTs in the Digital economy?

The emergence of 'social lives' in digital gaming worlds, particularly multi-player games, where users take on new identities and occupations in an imagined, unique environment and establish social and economic interactions there, may be linked back to the commoditization of NFTs. A digital object may be commoditized, purchased, and sold in gaming contexts as well as on secondary market sites. P2P gaming has progressed with the advent of blockchains, since creative worlds are no longer simply produced by curators who retain centralized control and players engage according to the norms of the universes, but are now co-made by participants acting as peers in the world.

The inherent qualities of non-fungible tokens, which are inherent in their nature, may be used to build value for producers in both the private and public sectors. NFTs are beginning to take shape and take on a more defined orientation, which is occurring in line with other legislative and market changes that are likely to have an influence on their development. Indeed, the future of NFTs is promising; they are gaining center stage in conjunction with the creation of a metaverse, which is intimately tied to the use of NFTs in the near future. The extension and evolution of the metaverse idea is also a driving force behind the emergence of NFTs since there will be a growth in the number of digital assets and online markets for people to interact with as a result of the increasing number of digital assets and online marketplaces. In the near future, the virtual world and its goods, which might either be entirely digital or virtual representations of actual assets, are likely to become a big part of our everyday lives. NFTs are one of the most considered newly industrialized of the previous several decades. Currently, new financial technologies (NFTs) provide new potential for content producers, in particular, to advertise their work through digital environments and to engage in secondary trading over the long term. This tackles the shortcomings of a centralized economic system as well as the lack of digital skills in today's world. Blockchain technology as a backbone, as well as Decentralized Finance for economic exchange, are both critical components of this strategy. The integrity and uniqueness of NFTs may be relied upon by participants in an ecosystem for economic exploitation without the need to attach themselves to a centralized middleman or marketplaces provider. Away from the realm of art, these concepts may be applied to virtually any industry that conducts commerce with both physical and digital items.

Question No. 3: How raising funds for the projects can be gamified? Benefits of Gamification.

Engaging your participants or supporters using gamification aspects in your peer-to-peer fundraising may have a significant influence on the degree of participation and support you receive. However, figuring out where to begin is not always straightforward. If your peer-to-peer fundraising platform does not allow for gamification, you have two choices to consider. A peer-to-peer fundraiser platform that incorporates the elements you desire to make your event more enjoyable may be found on the internet. If that is not a possibility, you may identify and reward

participants using manual techniques such as customer relationship management systems (CRMs) or reports on participant behavior. Particularly in our example study, when gamification features are used to crowdfunding, investors tend to spend more than the average individual who invests in firms on the S&P 500 list. It is the assignment of the Avatar appointment to the investor, which is essentially randomized dependent on the smart contracts, that propels the initiative forward rather than a regular fundraising effort. Investors who feel a sense of belonging to a community are more likely to spend more during the fundraising process. You're actively striving to make fundraising easier and more pleasurable for the individuals who are backing your fundraiser, which is a win-win for all involved.

The benefits of Fundraising with the game mechanics increase engagement and create a competitive environment and virality. Using these gamification elements, supporters of your fundraising campaign will have a greater feeling of personal participation in the campaign as they see apparent progress with each contribution. The points, scoreboards, and name tags all contribute to the creation of a healthy competitive environment that encourages participants to take action, whereas challenges and freedom of choice provide participants with the opportunity to experience or explore the causes and organizations to which they are donating. Competing with other fundraisers or fundraising teams may be a pleasant experience that might result in more donations in the long run. Incentives for action are provided via a points-based system; if supporters earn a specific amount of points, they are awarded incentives, which can be either actual or virtual in nature. It is believed that implementing audience engagement into a score or levels scheme stimulates people to reach out to their social networks, which in turn results in increased interest and contribution levels Another significant advantage of gamification is that it may help you to establish a feeling of togetherness among your backers.

Question No. 4: How efficient are NFTs as an Alternative Source to finance businesses?

It is possible to finance projects by non-traditional means, such as fund-raising through NFTs. There are, in my opinion, two options. In the first instance, project curators may fundraise while a project is in the planning or development stages, such as for a project that will later be 'NFTed'. Secondly, project developers may attempt to monetize a completed project through the use of NFT fractionalization.

Due to the fact that incentives are often for consumption rather than for monetary gain, donation-based crowdfunding satisfies the project and payment demands of artists, and backers engage mostly out of philanthropic or socially-based purposes, rather than for financial gain.

Although the self-regulatory character of non-financial project crowdfunding may make it more accessible to fund-raisers including such artists, this phenomenon would be considered as being excluded from investment markets, which would have the potential to extend the attractiveness of financing opportunities. A project that is designated as a non-fungible token collection is

obviously one that is targeted for future liquefication, and investors of such a project should not be barred from receiving investment-based rights, it has been suggested.

It is possible for non - financial projects to become engaged in the creation of investment goods, whether through the use of crowdfunding or NFT fractionalization for monetization. This broadens the appeal of nonfinancial initiatives to a broader range of backers, particularly those who are profit driven.

Question No. 5: How NFTs can be used to prove your investment, patents and intellectual property?

Strong assurances of ownership are provided by the Ethereum blockchain, allowing users to construct secondary marketplaces where they may sell and monetize in-game resources without having to deal with other parties. In the end, the reason why NFTs are so fascinating is because they are unleashing a new economic system, providing fresh liquidity to digital assets, and establishing an integrated worldwide market for these products in the process.

When it comes to concerns such as intellectual property, there is a scarcity of studies on the use of NFT. Trademark and patent applications are not only a time-consuming and tedious procedure, but they are also quite expensive. It is believed that non-fungible tokens have significant potential in the IP rights arena. It has the unique competence and aptitude in order to expand clarity and volatility while also opening the market to inventors who want to commercialize their innovations as quickly as possible. Blockchain technology enables secure timestamping, the ability to create smart contracts, and the ability to establish proof of existence. It empowers the formation of a translucent, cost-effective, and robust system that can be reachable to anyone and in which each activity is auditable to ensure that all transactions are transparent.

Because it is likely to configure the smart contact of a certain non-fungible token project to make a dividend immediately to the initial NFT purchaser on each subsequent purchase proceeded from the NFT collection, NFTs provide asset owners with the opportunity to generate a new source of revenue. Royalties are often granted as a certain fraction of the secondary sales, and they provide the option for generating an endless number of revenue streams over time.

In the case of an unauthorized third party who mints an NFT tied to the financial commodity without receiving permission from the asset owner, and then markets, purchase of goods or services and/or sells the NFT while employing the asset owner's trademark protection, the asset owner's interests may be infringed.

Patents based on NFTs may make it easier to share trustworthy information across patent offices and patentees all over the globe, decreasing the strain on investigators and, in some cases, even speeding up the process of harmonization. Additionally, patents based on NFTs have extra transparency and archiving features built-in from the start. An invention patent should be

considered a privilege reserved for those who undertake resource-intensive research to push the boundaries of technical capability. The public is very interested in the complete transparency of these prizes as a reward for their accomplishments. In today's systems, it is the society that bears the cost of the state in economic inadequacies. Patents based on NFTs have the potential to increase transparency. The use of an NFT-based patent, from an organizational standpoint, can alleviate present obstacles in the patent application process by making the application system more efficient, quick, and comfortable for applicants while not sacrificing the quality of patents issued.

To sum up application of Smart Contract usage and Issuing Non-Fungible Tokens for the crowdfunding process enables fundraiser:

Lowering all administrative and service costs: Blockchains ensure the credibility of the entire system through distributed consensus methods that do not require the involvement of a central broker or a middleman. The decentralized nature of blockchains allows smart contracts to be automatically activated in a decentralized manner. As a result, the administration and services costs incurred as a result of the participation of a third party can be reduced greatly.

Continuously improve the efficiency within the business process: Getting rid of the need on an intermediary can have a major influence on the productivity of a business process. As an illustration, consider the supply-chain mechanism described above. Once the predetermined condition is met, the settlement agreement will be accomplished automatically in a peer-to-peer fashion. This will allow for a significant reduction in turnaround time to be achieved.

Risk Reduction: The data integrity of blockchains ensures that smart contracts cannot be randomly changed after they have been created and executed. Aside from that, all of the transactions that are saved and replicated through the entire decentralized blockchain system may be traced or audited. Because of this, malignant behaviors such as fraudulent activity can be significantly reduced.

Shortly about gamification of this process and application of game methods to finance increase the engagement of investors. Gamification, in its most basic definition, occurs when you apply game-like design or tactics to non-game circumstances. Not only does this make things more enjoyable, but it also has the potential to significantly boost your involvement.

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DECLARATION

I, the undersigned ………… *KAMAL ASLAN* …………….………. aware of my criminal responsibility, I declare that the facts and figures contained in my dissertation correspond to reality and that it describes the results of my own independent work.

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