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From Features to Financing: Decipher the Relationship between NFT Marketplace Design and the Platform Fundraising Ability

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Abstract

As the NFT industry is emerging and gaining more and more attention from venture capitalists, this research aims to identify the relationship between NFT marketplace design and the platform fundraising ability and understand the underlying mechanisms for the relationship. Drawing on extant research on platform design and a quantitative study, this research uncovers two key factors in NFT marketplace design, Transaction Structure, and Community Engagement, as significant contributors to the platform fundraising ability. However, Community Governance is not correlated to fundraising ability despite pervasive discussions around it in the blockchain industry. Furthermore, grounded on an empirical comparison, this research closely observes the financing journeys of two predominant NFT marketplaces with contrasting platform designs. Leveraging the multiple case study and venture capital investment literature, this research points out that the venture capital investment decisions are driven by the growth potential of the NFT marketplaces, and the offerings of a decentralized community governance structure remains uncertain for investors, explaining the identified correlations and the absence of correlation for Community Governance. Overall, this research contributes a theoretical framework explaining the correlation between NFT marketplace design and fundraising ability, enriching the research regarding platform design and venture capital investment. Additionally, this research broadens the research on blockchain which is highly technical-centric as of now. Empirically, this research gives insights into NFT marketplaces regarding their platform design and fundraising in the future.

Keywords: NFT marketplace; Platform design; Platform governance; Decentralized autonomous organization (DAO); Fundraising; Venture Capital

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Definitions

Web 2.0 *"Web 2.0 is a network platform on which peers contribute to the development of tools, content, and communities on the Internet."* (Shang et al., 2011)

Web 3.0 *"Web3.0 is a decentralized online ecosystem based on blockchain."* (Edelman, 2021)

NFT *"Cryptographic assets on a blockchain with unique identification codes and metadata that distinguish them from each other."* (Peres et al., 2022)

Blockchain *"Blockchain is a distributed database solution that maintains a continuously growing list of data records that are confirmed by the nodes participating in it."* (Yli-Huumo et al., 2016)

DAO *"Decentralized autonomous organization (DAO) is a new organization form that the management and operational rules are typically encoded on blockchain in the form of smart contracts and can autonomously operate without centralized control or third-party intervention."* (Wang et al., 2019)

NFT Drop *"NFT Drop is the release of a new NFT collection or project."* (Reijsbergen et al, 2021)

Platform Design A spectrum of design choices regarding the infrastructural capabilities and governance mechanisms employed by a platform.

1. Introduction

Non-fungible tokens (NFTs) have gained mounting attention in recent years, especially since 2021, a phenomenal year when the NFT market was worth $41 billion, nearly the total value of the entire global fine art market (Conti, 2023). NFTs represent one of the nascent and novel applications of blockchain technology, allowing a new way of authenticating (Hughes et al., 2019) and having transformed the content creation (Wilson et al., 2022). According to Peres et al. (2023), an NFT is a "*cryptographic asset on a blockchain containing unique identifying information and codes that separate them from one other.*"

However, since the NFT industry is still in its early stage, little research has been in place (Taherdoost, 2022) with a representative research focus on the efficiency and spillover effects of the NFT market (Bao & Roubaud, 2022). Even in a broader context of blockchain, despite the potential managerial and organizational impact in areas other than finance, extant research mostly revolves around the technical aspects of blockchain (Risius & Spohrer, 2017). Hence, although the NFT marketplace is an integral part of the current NFT ecosystem (Wilson et al., 2022) and a significant manifestation of blockchain-based digital platform, even less related research has been conducted. To bridge the research gap, this research zooms in on the NFT marketplace with a focus on its platform design.

So far, approximately 133 active NFT marketplaces exist across the most popular blockchains such as Ethereum, Polygon, and Solana (Alchemy, 2023). Early marketplaces include OpenSea, SuperRare, and Rarible. Among them, OpenSea has become the world's first and largest Web 3.0 marketplace for NFTs and crypto collectibles (OpenSea, 2023). The early NFT market largely revolved around digital art and collectibles, but more categories are emerging as the market evolves (Sharma, 2023). In the current market, some marketplaces (e.g., OpenSea, Rarible) offer services for multiple kinds of NFT content transactions, while other marketplaces (e.g., SuperRare) focusing on a niche category, especially fine art, are also noticeable (Wilson et al., 2022).

A buzzing topic nowadays regarding NFT marketplace design is community governance. Blockchain technology enables the decentralization of governance on NFT marketplaces, that is,

no centralized authority to make the rules (Jahani et al., 2018). Under a decentralized governance structure, platform participants can collectively possess complete control of platform governance. This enables individuals to express their viewpoints and ensures transparency during the governance process (Ostrom, 1990). Currently, forming the platform as a Decentralized Autonomous Organization (DAO) where decentralized coordination among autonomous actors takes place (Mesquita & Brush, 2008) is a common approach for NFT marketplaces to practice a decentralized community governance model. One founder of an NFT marketplace mentioned (Bussgang et al., 2022), "*The game has changed. You can apply the old Web 2.0 playbook to drive growth, which is great for consumers and creators, but you cannot create equity value in Web 3.0 because the data lives everywhere. ... We need another lever to create network effects and we believe the DAO will provide that.*"

However, there is no uniform answer on whether to transition a DAO in the NFT marketplace world. As one of the branching points in NFT marketplace design, some marketplaces are on their journey to becoming a DAO or have already become a DAO, while others still choose to maintain centralized governance. Another obvious difference in NFT marketplace design is the distinguished positioning in the market. As mentioned earlier, some marketplaces focus on broader markets supporting several types of NFTs, while others concentrate on niche categories. Noticing the variations in platform design, including the platform governance and the difference in positioning, we will go deeper into the NFT marketplace design as a main focus of this study.

Meanwhile, as startups in the NFT market, NFT marketplaces are actively seeking potential funding for future development. Andreessen Horowitz and Paradigm, two of the world's largest venture capital firms, became leading investors in the NFT space in 2021. However, they were not the only players and not the first ones who invested in this emerging industry. Other venture capital firms and investors jumped on the NFT bandwagon, developing similar investment strategies in the NFT industry. Venture capital firms, the main investors for startups, provide significant and stable funding to sustain platform business (Rahman & Thelen, 2019) and thus enable them to focus on long-term value creation (Harrison et al., 2016). According to data recorded by the CoinCarp Platform, an established database in the global cryptocurrency industry, as of September 2023, global funding for NFTs surged to $1.35 billion.

1.1 Purpose and Contribution

Despite a notable influx of funding into NFT marketplaces in recent years, substantial variations exist in the amounts raised by different platforms. Moreover, these NFT marketplaces exhibit divergent patterns in platform design. As a result, our research interest lies in exploring the potential relationship between NFT marketplace design and fundraising ability.

This research will examine the NFT marketplace design based on relevant theories, identify the relationship that is of research interest through a quantitative analysis, and investigate the motivation of venture capitalist investment for NFT marketplaces grounded on a qualitative analysis.

Extant platform-relevant research predominantly focuses on the value creation process in platform ecosystems and the functioning of platforms (Fu et al., 2021). The research related to blockchain-based platforms primarily revolves around blockchain model issues and decentralized governance mechanisms from a technical perspective (Risius & Spohrer, 2017). Little is known regarding NFT marketplace, especially the platform design. Therefore, the study is expected to contribute theoretically to the limited research on blockchain-based digital platform (Constantinides et al., 2018) and the platform design. Meanwhile, as the first to shed light on the relationship between NFT marketplace design and fundraising ability, this research can provide empirical insights for NFT marketplace players concerning fundraising in the current competitive landscape.

1.2 Research Question

The study aims to answer the following research question:

> *How does NFT marketplace design influence the platform's fundraising ability and what are the underlying mechanisms?*

2. Literature Review

The literature review serves as guidance for understanding the relevant concepts related to the research question. To comprehend how the design of an NFT marketplace influences the

platform's fundraising ability, it is crucial to first grasp the nature of the NFT marketplace and the pertinent concepts of platform design in the Web 3.0 context. Additionally, to gain further insight into the fundraising ability of the platform, the literature on investment strategy was also reviewed.

2.1 Platform

Platforms exhibit distinct advantages in creating and acquiring value in the digital economy (Gawer, 2021) and facilitating the exchange of resources in innovative ways (Yoo et al., 2010). Cusumano et al. (2019) proposed a typology of platforms based on how they create value, classifying them into three types. The first type is transaction platforms, which typically act as intermediaries between buyers and sellers. These platforms facilitate transactions by leveraging digital technology to create efficient matches for globally connected internet users at low search costs. The second type is innovation platforms, serving as technological building blocks that enable third-party companies, such as software developers, to build a multitude of complementary products or services. The last type is hybrid platforms, combining the characteristics of both innovation and transaction platforms. Examples include Amazon, Apple, and Facebook.

The value creation within the platform is shaped by a range of factors, such as governance (Tiwana et al., 2010; Gawer, 2014), competition (Rochet & Tirole, 2003; van Alstyne et al., 2016), openness (Eisenmann et al., 2009), and the handling of quality and consumer expectations (Zhu & Iansiti, 2012). While the specifics may differ among platforms and industries (McIntyre & Srinivasan, 2017), the platforms are designed with a common goal to facilitate the value creation. The platform design includes aspects such as platform governance and is influenced by competitive dynamics in the market.

2.2 Platform Governance

A platform is a set of stable components that can dynamically generate different products or projects for users while trying to achieve efficiency and flexibility (Ansell & Miura, 2019) through constant internal restructuring in the face of rapid technological and market changes (Ciborra, 1996). Besides creating value for users, platforms also require contributions from various participants with different perspectives and goals (Darking et al., 2008; Jacobides et al.,

2018). It is essential to have a thoughtful platform governance model as part of platform design to encourage meaningful interactions among stakeholders and ensure platform performance. Individual incentives and local information should be embedded in an effective governance structure (Hurwicz, 2008; Mookherjee, 2006; Myerson, 2008). By leveraging individual incentives, both platform owners and participants can realize their respective interests (Hurwicz & Reiter, 2006). Moreover, making the best use of all available information can facilitate the governance process and achieve desirable governance outcomes (Hurwicz & Reiter, 2006). An effective platform governance approach can help align incentives, resolve conflicts, coordinate actions, and foster a shared identity (Tiwana et al., 2010; Wareham et al., 2014; Gawer & Phillips, 2013; Kyprianou, 2018).

2.2.1 Centralized Platform Governance

As digital platforms have become dominant in recent years, platform owners have garnered substantial power and influence, playing key roles in platform governance (Chen et al., 2021; Kyprianou, 2018; Mair & Reischauer, 2018; Rietveld et al., 2019; Wareham et al., 2014). With this centralized platform governance structure, platform owners take more decisive actions than other stakeholders and the decision-making process can be quick (Chen et al., 2021). However, platform owners may sometimes act in their own interests rather than the best interests of all stakeholders (Srnicek, 2017; Van Dijck et al., 2018; Zuboff, 2019), leading to concerns about the growing power of platform owners (Chen et al., 2021).

Some proprietary digital platforms with centralized governance structures have also embraced open-source initiatives. However, the decision rights of the future platform development are still centralized in the hands of platform owners while other stakeholders can make suggestions (Pereira et al., 2019).

Besides the decision-making aspect of platform governance, another important component is incentive (Chen et al., 2021; Pereira et al., 2019). The primary incentive leveraged under this centralized governance structure is the pricing structure (Pereira et al., 2019), which has been studied in a lot of literature (e.g., Rochet & Tirole, 2003; Weyl, 2010). The decisions about

pricing structure include the decision regarding fixed membership fees and/or per-transaction fees and cross-subsidization pricing strategy (Rochet & Tirole, 2006).

2.2.2 Decentralized Platform Governance

In a decentralized governance structure, platform participants collectively possess full control of governance. This enables them to represent their individual perspectives and utilize their respective local information (Ostrom, 1990), enhancing the democracy and informational efficiency of the governance process (Ostrom, 1990, 2000, 2010). Nonetheless, there are tradeoffs regarding adopting a decentralized governance structure as well (Chen et al., 2021). Distributing governance power too widely can make each participant have little power to shape governance outcomes, potentially discouraging their engagement in the governance process (Ostrom, 1990). Therefore, excessively decentralized governance authority may fail to mobilize collective action and slow down the decision-making process (Hardin, 1968; Olson, 1971).

While the majority of digital platforms in Web 2.0 adhere to similar centralized governance structures, the emergence of blockchain technology has brought the opportunity for digital platforms delve into alternative platform governance frameworks. The decentralized platform governance structure has gained pervasive attention in the blockchain industry.

Blockchain-based platforms usually primarily leverage crypto-incentives in their decentralized governance structures, which are blockchain assets that are interchangeable and tradeable within the platform, or can be converted into other cryptocurrencies or traditional fiat currencies outside the platform (Pereira et al., 2019). Crypto-incentives function as a coordination mechanism among stakeholders, equivalent to pricing structures in centralized platforms (Pereira et al., 2019).

For Blockchain-based platforms with decentralized governance structures, decision-making takes place in the communities around the platform. During the process, community members make suggestions to set the rules and amend the code of the platform. Different from the open-source movements where community members can only make suggestions but cannot make the final

decisions, a decentralized governance structure empowers the community to make the final call through forums, discussion groups, or voting systems (Pereira et al., 2019).

2.2.2.1 Decentralized Autonomous Organization (DAO)

As a possible format for blockchain-based platforms (Lumineau et al. 2020), DAO exemplifies decentralized platform governance and illustrates how blockchains improve structural coordination through machine consensus (Catalini & Boslego, 2019; Hsieh & Vergen, 2018; Murray et al., 2021). In a DAO, there is no central authority issuing administrative directives or delegating tasks to organization employees. Instead, routine activities are performed based on the structural specifications of actors' roles encoded in algorithms (Lumineau et al. 2020).

DAO participants cast votes on proposals using tokens which are sometimes issued by the platforms as an incentive and decisions are made based on these votes (Murray et al. 2021). In this way, the decision-making process can incorporate diverse perspectives and interests, maximizing the overall welfare of the community rather than prioritizing platform owners' interests. Besides, each participant can leverage local information (Ostrom, 1990) and data shared through blockchains which are independently verified, improving informational efficiency (Ostrom, 1990) and process transparency (Brown, 2016). However, Bena and Zhang (2022) argued that DAO may not necessarily be the right way to democratize these communities, especially given the wealth distribution based on token-based voting mechanisms. Goldberg and Schär (2023) pointed out that many governance proposals are actually decided by a very small number of people, and the choices of dominant voters almost always reflect the final outcome but may not necessarily align with the consensus of other voters.

2.3 Competitive Dynamics

The key focus of the existing literature on platform competition centers around the notion of network effects, where consumers attribute greater value to platforms boasting a larger user base (Cennamo & Santalo, 2013). Network effects can be categorized as direct network effects and indirect network effects. Direct network effects pertain to the increased value that network participants receive, contingent on the number of other users in the network with whom they can interact (Eisenmann, 2007; Katz & Shapiro, 1986). For example, the value of online social

networks such as Instagram and LinkedIn grows as the number of participants on the site increases.

Additionally, indirect network effects refer to users experiencing enhanced value indirectly when anticipating that platforms with more users will provide a greater variety of complementary products and services (Evans, 2003; Rochet & Tirole, 2003). Consequently, systems expected to be popular, with more widely available components, will gain even more popularity as a result (Katz & Shapiro, 1994).

2.3.1 Winner-Take-All

Based on the network dynamics, some literature (e.g., Besen & Farell, 1994; Shapiro & Varian, 1999) suggests a winner-take-all (WTA) logic, where the platform with the most extensive user base will make the markets tip.

Under this "winner-take-all" logic in platform-based markets, it is common for a single or a few platforms to dominate the market (Buge & Ozcan, 2021). To establish their dominance, platform companies often accelerate the acquisition of users and complementors to activate distinct network effects (Stalkamp & Schotter, 2021) and secure a leading position (Brynjolfsson & Kemerer, 1996; Gupta et al., 1999; Zhu & Iansiti, 2012). In markets where a single winner prevails, quickly gaining a substantial market share is deemed crucial for the sustained survival and success of platforms (Buge & Ozcan, 2021). The strategy of "rapid scaling" (Lee et al., 2006) frequently drives platform companies to adopt aggressive measures to vie for dominance. For instance, they may use licensing tactics such as sweetheart deals to attract more application developers or exclusive contracts to ensure content exclusivity (Cennamo & Santalo, 2013). These strategies restrict similar goods from being offered by rival platforms while enhancing the competitiveness of their platform products at the same time (Hagiu, 2009; Mantena & Saha, 2012; Yoffie & Kwak, 2006). Alternatively, platforms may opt for a low-pricing approach to instantly penetrate the market and expand their user base (Clements & Ohashi, 2005; Eisenmann et al., 2006). As the overall value of the platform rises with an increased user base, scholars believe that such actions will generate network effects in a new round (Jacobides et al., 2018), establishing a positive cycle of expansion and value creation.

2.3.2 *"Let a Thousand Flowers Bloom"*

Platform differentiation allows different platforms to have the chance to stand out, avoiding direct competition with other platforms (Taeuscher & Rothe, 2020). This is particularly true when other competitors have not set up a similar presence (Haans et al., 2019). Platform differentiation would be effective when there exist diverse user preferences and low switching costs in the market. By positioning differently, platforms can coexist successfully (Cennamo & Santalo, 2013; Eisenmann et al., 2006).

In those platform markets where users have various tastes and preferences (Rietveld & Eggers, 2018), having a focus on a niche market can satisfy a specific group of users by aligning the platform offerings closely with the needs of the target audience (Chernev, 2007). When the switching costs are low, it is possible for users to use multiple platforms with respective unique offerings rather than a single comprehensive platform. For instance, Amazon users might switch to a platform specializing in electronics when buying a phone and might turn around to a platform exclusively dedicated to pet supplies when purchasing pet food.

Moreover, platform differentiation can be usually found in a competitive market in which there might already be a dominant player with network effects (Hill, 1997; Katz & Shapiro, 1994). In this situation, some other platforms are forced to quit markets that are occupied by the dominant platform. Instead, they choose to differentiate themselves by focusing on less profitable and niche markets (Cennamo & Santalo, 2013). Although surrounded by challenges, some of these platforms can encounter new opportunities by establishing a "true identity" in the niche market they choose (Swaminathan, 2001), and become the preferred choice for some consumers with specific preferences.

2.4 Investment Strategy

In order to comprehend the factors influencing the fundraising capabilities of NFT marketplaces, it is essential to delve into the investment strategy from the investor's perspective. Consequently,

literature on investment strategy has been considered to offer a foundational understanding of the investors' decision-making process.

There are various types of investments in emerging industries, such as Venture Capital Investment and Angel Investing. Given the research focus on the NFT Marketplace, where a significant portion of investments is conducted by Venture Capital Investors, literature on Venture Capital Investment is considered the most relevant and applicable in this context.

2.4.1 Venture Capital Investment

Venture capital is a specific investment pattern known as the "power law" (Birch, 2022; Mallaby, 2022). The returns on venture capital investments deviate from a normal distribution, with significant returns concentrated in a small number of investments (Mallaby, 2022). Thus, influenced by the "power law", venture capital firms always invest in multiple companies, anticipating that only one or two will yield the necessary returns for the success of the fund (Sauter, 2022).

Following this investment logic, venture capital, as a mode of valuation, is largely influenced by the investors' expectations for potential investees (Beckert, 2013). These expectations include the future uncertainty and growth projections, pictured by both investees and venture capital investors during the funding process (Fabozzi, 2016) and reflected in the narratives created, e.g., pitch deck. According to Liu (2020), the primary objective of ventures' narratives is to sell a vision, showcasing how they actively shape the world through the narratives they weave. Meanwhile, venture capitalists rely on the stories and visions presented by ventures to identify profit opportunities (Birch, 2022). For emerging industries, due to the lack of a standard methodology to assess the company's potential, narratives are particularly important for venture capitalists to make investment decisions (Klonowski et al., 2018; Muniesa et al., 2017).

2.5 Application of the literature

The literature review laid the foundation for understanding the relevant concepts in the research question and inspired the observation of various NFT marketplace designs. The literature on platform governance resonates with the ongoing discourse on decentralization in Web 3.0 and reflects the diverse practices implemented by NFT marketplaces.

The literature on venture capital investment will be leveraged in the analysis of the mechanisms through which fundraising ability is impacted by different marketplace designs, serving as inspiration for the formulation of propositions.

3. Research Design

3.1 Methodology

Aiming to capture the relationship between NFT marketplace design and the fundraising ability of NFT marketplaces, this study leveraged a mixed methodology, including a quantitative Study 1 and a qualitative Study 2. In Study 1, we planned to leverage a linear regression analysis to uncover the potential correlations that are of our research interest. In Study 2, we decided to use a multiple-case study approach to further understand the findings from Study 1.

Regression analysis is a prominent technique for understanding the correlations between dependent variables and independent variables (Scrucca et al., 2010). Thus, in the context of accessible funding data and abundant platform design information, regression analysis is a suitable way to study how the fundraising ability of NFT marketplaces is impacted by certain ways of platform design.

Due to the early stage of the NFT industry, the possibility of limited suitable samples was taken into account. To deepen the understanding of the mechanisms underlying the findings of Study 1, a qualitative Study 2 was designed to complement the quantitative Study 1 by offering an in-depth investigation through a case study (Feagin et al., 1991). Moreover, research about NFT is still in its early stage, resulting in a lack of prior theorizing about this topic. Hence, with an exploratory intent of this research to expand the theory field of the emerging NFT industry, an inductive multiple case study approach allowing for replication logic (Yin, 1989) is appropriate to use in this context, allowing generating and testing theories in an emerging research domain (Eisenhardt, 1989).

3.2 Empirical Setting

This research focuses on NFT marketplaces that provide services for NFT art transactions as the empirical field. This choice was primarily driven by the representativeness and the relatively long history of the digital art category in the NFT market. NFT art includes digital paintings, illustration, photography, 3D art, animations, and other forms. Marketplaces for NFT art transactions range from comprehensive platforms catering to all kinds of NFTs to specialized venues dedicated solely to NFT art.

4. Study 1

4.1 Data Sampling

The study followed three steps to determine the selection of the sample: (i) Initial sampling of NFT marketplaces; (ii) Refinement of the sample based on funding data; and (iii) Refinement of the sample based on transaction content.

First, to compile a comprehensive list of NFT marketplaces involved in overseeing NFT art transactions, DappRadar was utilized as the initial resource. DappRadar is recognized as the leading distribution platform for Web 3.0 decentralized applications and offers extensive rankings and insights into NFT marketplaces. To weed out those NFT marketplaces definitely without artwork transaction services, 4 out of 7 marketplace categories were chosen on DappRadar (Filter: General, Dedicated, Art, and Music; The rest: Gaming, Domains, and Other). In September 2023, 72 NFT marketplaces were on the list in DappRadar. To further enlarge the sample, this study also referred to a list of 172 NFT marketplaces supported by OpenSea, which has the biggest NFT aggregator currently. In this phase, an initial sample of 194 marketplaces was defined, based on the union of the DappRadar list and the OpenSea list. However, it's worth noting that this number includes marketplaces that are no longer active in the market as of now, and not all the marketplaces on this initial list provide NFT art as transaction content because the "Dedicated" category on DappRadar does not ensure a specialization in art, and OpenSea aggregates all kinds of NFT.

Second, since this research aims to find the correlation between NFT marketplace design and the platform fundraising ability, NFT marketplaces that have raised funding previously are our research subject. CoinCarp was used to collect funding data, which is a cryptocurrency market database providing fundraising events information for all the crypto and blockchain projects. According to the CoinCarp database, 141 funding rounds with a total funding amount of $1.31 billion took place in the NFT marketplace category until 30th September 2023. All the 194 NFT marketplaces from the first sample were screened on CoinCarp and cross-checked by both authors. A list of 43 NFT marketplaces with funding was extracted and the corresponding funding data was also recorded in this step, from the earliest funding in Apr 2019 for MakersPlace to the latest funding in Sep 2023 for TRLab.

In the final step, for identifying NFT marketplaces with the financial capability to oversee NFT art transactions, each website from the list in the second step was thoroughly scrutinized. 7 marketplaces without NFT artwork transaction service were excluded and a final sample containing 34 NFT marketplaces was defined, including all-around NFT marketplaces, e.g. OpenSea and Rarible, and NFT art marketplaces, e.g. MakersPlace and SuperRare. A list of final samples can be found in Appendix 1.

4.2 Data Collection

CoinCarp provided all the necessary funding data of sample marketplaces, including amount, round, and time. To ensure the data accuracy, two databases that contain comprehensive investment information of companies, Crunchbase and Pitchbook, were used to cross-check the data gathered from CoinCarp, which turned out to be aligned across three different databases. Note that the funding amounts collected in this step were only the disclosed amounts.

The official websites of 34 sample marketplaces were carefully screened by authors to get necessary data about the platform design. In addition to the features of the platforms, whitepapers issued by the marketplaces, and FAQ pages always offered comprehensive and abundant information about the focal marketplace.

Moreover, to have a close look at each community formed by the marketplace, we have joined each Discord group chat of sample marketplaces since 1ˢᵗ September to constantly observe the community dynamics, gain internal information, and interact with community members including platform users and staff.

Data for study 1 was collected in September 2023.

4.3 Data Analysis

4.3.1 Analytical Tool

The data was analyzed using the statistical computing tool Rstudio.

4.3.2 Dependent Variable

Funding

Funding refers to the sum of disclosed funding amount the NFT marketplace has raised since it was founded until 30ᵗʰ September 2023.

4.3.3 Independent Variable

The independent variables were selected based on our observations and literature review, and thus include both traditional elements familiar to customers and widely used in Web 2.0 marketplaces, such as launchpad and fee structure, as well as unique features in Web 3.0, such as DAOs, proposals, and tokens (Bena and Zhang, 2022).

Decentralized Autonomous Organization (DAO)

A decentralized autonomous organization (DAO) is an organizational structure devoid of a centralized governing body, whose members act in the best interest of the entity. Some NFT marketplaces are organized as DAOs, where participants, including creators, collectors, and other stakeholders, can have a say in the platform governance and collectively decide the development of the platform.

This variable is characterized as binary. The presence of DAO structure is represented as "1", while the absence is denoted as "0".

Token

Some NFT marketplaces have launched their native tokens which are often distributed to users as a way of encouraging participation. In a DAO, token holders are empowered to participate in the platform's governance protocol and benefit from the profit of the marketplace through community ownership. In the current DAO practices of NFT marketplaces, the decision-making processes are always based on a token-based voting system.

This variable is characterized as binary. The presence of a native token is represented as "1", while the absence is denoted as "0".

Proposal

Proposals are specific actions, initiatives, or changes that members of a DAO can suggest. DAO members are able to vote on the proposals to make decisions about the development of the platform based on the community consensus. See Figure 1 as an example.

This variable is characterized as binary. The presence of previous proposals is represented as "1", while the absence is denoted as "0".

*Figure 1: A proposal in Rarible Protocol DAO*
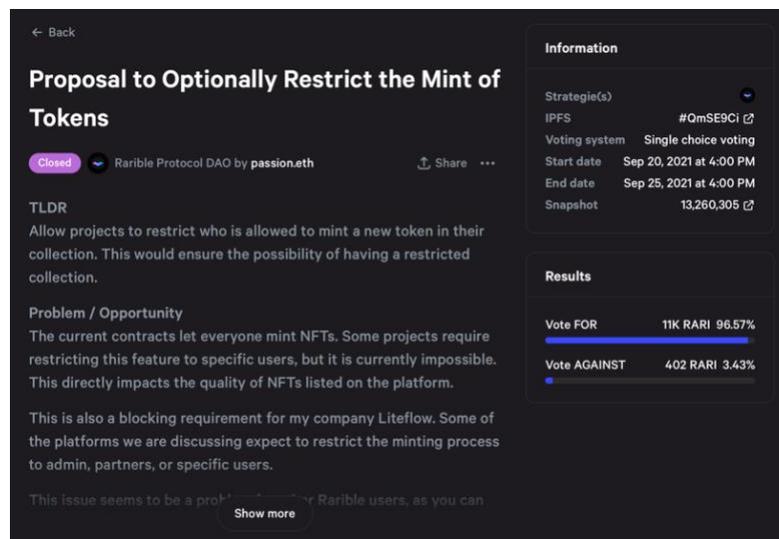
Knowledge Sharing (KS)

Since NFT is still in its beginning phase, a lot of potential users for NFT marketplaces may lack the requisite knowledge and understanding of the NFT ecosystem and blockchain technology. Beyond offering guidance specific to their respective platforms, certain NFT marketplaces also provide comprehensive tutorials explaining various aspects of the industry, the underlying technology, and the mechanisms involved. This serves the purpose of educating and guiding users, addressing the informational gaps among individuals entering the NFT space. See Figure 2 as an example for KS.

This variable is characterized as binary. The presence of a knowledge-sharing system is represented as "1", while the absence is denoted as "0".

Figure 2: Seller's University of Mintable
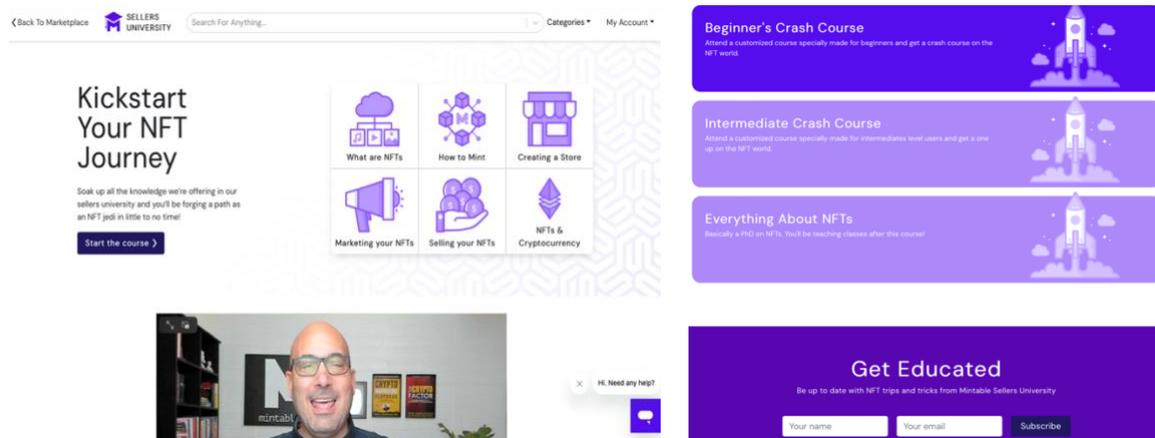
Roadmap

Most NFT marketplaces are still in the beginning phases of their development. Hence, a roadmap can trace the development of the platform and envision the future stages for the stakeholders. Some marketplaces choose to publish their roadmaps. Some marketplaces do not choose to present the entire roadmap in a public way but actively communicate with community members when it comes to some roadmap-related questions. There also exist NFT marketplaces that neither publish their roadmaps nor actively respond to relevant questions in the community. See Figure 3a and 3b as examples for Roadmaps.

This variable is characterized as binary. The presence of a public roadmap or active communication regarding the roadmap is represented as "1", while the absence is denoted as "0".

Figure 3a: Roadmap published on the official website by TRLab
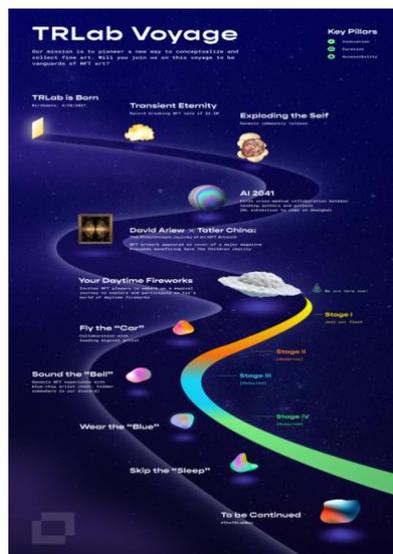
Figure 3b: Roadmap published within the Discord community by AlienSwap
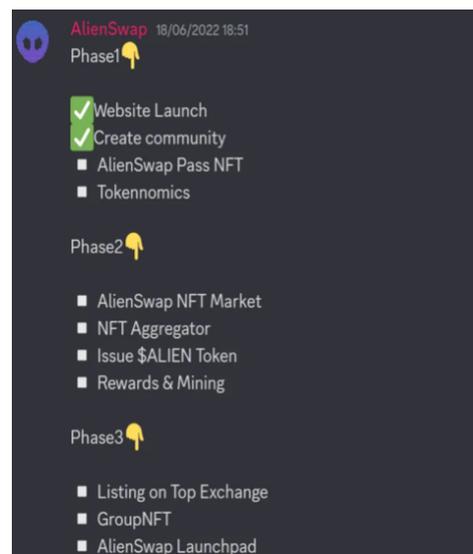
Community Events (Events)

Various community events are sometimes organized for community members by the NFT marketplaces. Common online events in NFT communities include giveaways, exhibitions, and community challenges. Some NFT marketplaces also hold offline events, e.g., community meetups and anniversary celebrations. The event information can usually be found in the community group chat on Discord or other social media accounts, e.g. Twitter. Some NFT marketplaces post relevant announcements on the marketplace websites and blogs as well.

This variable is characterized as binary. The presence of community events is represented as "1", while the absence is denoted as "0".

Discord Member (Discord)

As community is a pervasive concept for Web 3.0 and Discord is popular among blockchain enthusiasts, NFT marketplaces tend to form their online communities on Discord. Users can choose to join the Discord group through invitation links provided by each NFT marketplace.

The number of members for each Discord group of sample NFT marketplaces was collected on 25th September 2023.

Internal Drop (Drop)

In addition to public drops accessible to all users on marketplaces, certain NFT marketplace communities organize exclusive internal drops specifically tailored for their community members. These internal drops are usually published within Discord community group chat.

This variable is characterized as binary. The presence of internal drops is represented as "1", while the absence is denoted as "0".

Specialization (Spec)

Besides all-around NFT marketplaces that support all kinds of NFT content transactions, some NFT marketplaces are dedicated to NFT art. Among these NFT art marketplaces, some target a niche art category, such as photography, 3D art, and fine art. In this study, the variable "specialization" is defined as a focus on a niche art category.

This variable is characterized as binary. The presence of such a specialization is represented as "1", while the absence is denoted as "0".

Vetting

NFT marketplaces for creators include open marketplaces where any artists can list their content and closed marketplaces where creators are vetted (Wilson et al., 2022) by the marketplace.

This variable is characterized as binary. The presence of a vetting process is represented as "1", while the absence is denoted as "0".

Affiliate Marketing (Affiliate)

To generate new traffic and attract more users, some NFT marketplaces use affiliate marketing programs to incentivize current users to invite new users to the platform. Incentives vary from marketplace to marketplace. Common incentives include discounts on future transactions and platform native tokens.

This variable is characterized as binary. The presence of an affiliate marketing program is represented as "1", while the absence is denoted as "0".

Primary Sales Fee (Primary)

A primary sale of an NFT refers to the initial purchase from the creator. A platform fee is usually charged on the initial sales of an NFT on the marketplaces. The primary sales fee percentage varies depending on the platform.

The primary sales fee percentage for each sample NFT marketplace was collected. If the marketplace charges a percentage within a certain range instead of a fixed percentage, the mean of two boundary values of that range was collected.

Secondary Sales Fee (Secondary)

A secondary sale of an NFT refers to selling a pre-owned NFT after its initial purchase from the creator. NFT marketplaces also charge a certain percentage platform fee on secondary sales and the percentage varies.

The secondary sales fee percentage for each sample NFT marketplace was collected. If the marketplace charges a percentage within a certain range instead of a fixed percentage, the mean of two boundary values of that range was collected.

Royalty

Different from the traditional art market where artists typically derive revenue solely from the initial sale, NFT marketplaces allow the possibility for the original creators to earn ongoing revenue from future resales. The percentage of the resale price distributed to the original creator is called royalty. Although artists can benefit from future resales, buyers' purchase willingness can be hindered by paying royalties. There are ongoing debates about whether royalties should be eliminated from NFT marketplaces.

The royalty percentage for each sample NFT marketplace was collected. If creators can customize the royalty percentage within a certain range, the mean of two boundary values of that range was collected.

Auction

Besides trading NFTs based on a fixed price, auction is also a possible function on some NFT marketplaces. An auction usually runs for 24 hours. Through this auction feature, sellers are allowed to submit their NFTs for auction, with usually 20% of the NFT value distributed to the platform. Buyers can bid in auctions and the highest bidder will get the NFTs that they bid for.

This variable is characterized as binary. The presence of auctions is represented as "1", while the absence is denoted as "0".

Aggregator

Some NFT marketplaces provide aggregated information about NFT collections across multiple marketplaces, allowing buyers to browse and discover NFTs all in one place. An aggregator feature typically provides information such as price, volume, and sales within a definite time period. See Figure 4 for an example.

This variable is characterized as binary. The presence of an aggregator feature embedded is represented as "1", while the absence is denoted as "0".

Figure 4: Aggregator on Opensea

Launchpad

Some NFT marketplaces enable sellers to launch their own marketplaces for listing and selling NFTs through the launchpad feature. Rules for operating users' own marketplaces may vary among different NFT marketplaces, but the functionalities are generally similar. This launchpad feature enables sellers to create and customize their marketplaces, foster their own communities, and earn money through transaction fees and listing fees in their marketplaces. Figure 5 shows an example of a marketplace launchpad for individual users.

This variable is characterized as binary. The presence of a launchpad for sub-marketplaces is represented as "1", while the absence is denoted as "0".

Figure 5: Marketplace launchpad on Rarible
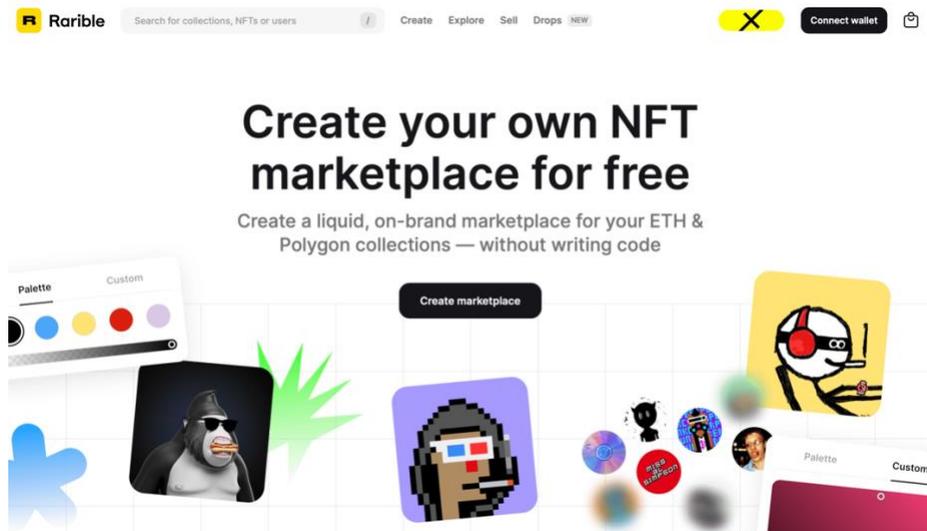
Informative Description (InformD)

Some marketplaces present an informative description for each NFT artwork at its detailed page while some simply put a short introduction doing nothing with the artwork content or do not have this section at all.

This variable is characterized as binary. The presence of informative descriptions is represented as "1", while the absence is denoted as "0".

Fiat Currency (FiatC)

Although NFT marketplaces are built upon blockchain as the platform digital infrastructure (Constantinides et al., 2018), some marketplaces extend the flexibility for users to conduct NFT transactions using fiat currency instead of cryptocurrency. This feature is leveraged by some marketplaces to cater to users who may not possess cryptocurrency but express a desire to engage in the acquisition of NFT assets. This inclusive approach broadens the accessibility of NFT markets, extending participation to individuals who may not be actively involved in the cryptocurrency ecosystem.

This variable is characterized as binary. The presence of such a feature is represented as "1", while the absence is denoted as "0".

Crypto Wallet (Wallet)

Users can connect their crypto wallets to the marketplaces for trading NFTs. Some NFT marketplaces support various crypto wallets while some only support one.

The number of compatible crypto wallets of sample NFT marketplaces has been collected.

Blockchain

Blockchain serves as a fundamental digital infrastructure for NFT marketplaces. Some NFT marketplaces support NFT transactions on more than one specific blockchain.

The number of compatible blockchains of sample NFT marketplaces is collected.

4.3.4 Pilot Analysis

4.3.4.1 Descriptive Statistics

To shed light on the investment trends in NFT marketplaces over the years, descriptive statistics on our sample are as follows. Table 1 describes funding amounts along with the proportion for each year, showing a significant growth from 2020 to 2022. In 2022, the NFT marketplaces got the highest funding amount from investors, accounting for 70.6% of the total funding from 2018 to 2023. This indicates that 2022 was an exceptional year for NFT investment, with a significant influx of capital into the NFT market.

Table 1: Funding amount across years

Year	Funding amount ($ Million)	Proportion (% of total)
2018	2.12	0.3%
2019	4.1	0.5%
2020	1	0.1%
2021	195.8	25.2%
2022	548.95	70.6%
2023*	25.9	3.3%
Total	777.87	100%

*Note: *Until 30th September 2023*

The data sample consists of 34 observations of NFT marketplace. In Table 2, which presents the summary statistics of dependent variables, *Funding* variable has undergone log transformation to approximate a normal distribution more closely. The minimum log-transformed value is -0.92, indicating the presence of original values less than 1, as log transformation can yield negative values for fractions. The maximum value is considerably higher at 6.06, showcasing a wide range in funding amounts. The standard deviation, at 1.31, highlights the variability in the funding amounts. The mean of these log-transformed values stands at 1.73, with the median at

1.59, suggesting a right-skewed distribution. Despite the transformation, some skewness remains, but the distribution is closer to normal than it would be in its original form, facilitating more robust statistical inferences.

Table 2: Summary statistics of dependent variables

	Funding
N	34
Min	-0.92
Max	6.06
Mean	1.73
Median	1.59
Stdev	1.31
Skewness	1.16

Table 3 below provides summary statistics for independent variables of these observations. Among all the independent variables, the *Discord* variable had a logarithmic transformation to reduce the absolute numerical values of the original data, making the data more stable and mitigating the issues related to collinearity and heteroscedasticity in the model. After this transformation, the variable *Discord* is in a narrow range, with slightly left-skewed.

Moreover, the standard deviations of *Primary*, *Secondary*, and *Royalty* variables are all quite small, indicating that, overall, the commission fees and royalty fees in the NFT art marketplace do not exhibit significant disparities. The *Blockchain* variable is numeric with a relatively wide range, a mean greater than the median, and positive skewness. This suggests that some marketplaces can mint their NFTs on more blockchains compared to others. A similar pattern is observed in the Wallet variable, where higher values are present in the dataset.

Additionally, the *DAO* variable has a mean of 0.35, suggesting less than half of Marketplaces grant members voting rights. *Token* variable, with a mean of 0.56, meaning that about half of

Marketplaces issued their token. Variable *Proposal* has a sum of 9, implying only 9 Marketplace communities have raised their proposals to engage platform governance. On top of that, *KS*, *Roadmap*, *Events*, *Drop*, *Spec*, *Vetting*, *Affiliate*, *Auction*, *Aggregator*, *Launchpad*, *FiatC*, and *InformD* are also dummy variables and have different means and medians, indicating variations in their distributions.

Table 3: Summary statistics of independent variables

Variable	Min	Max	Mean	Median	Sum	Stdev	Skewness
DAO	0.00	1.00	0.35	0.00	12.00	0.49	0.59
Token	0.00	1.00	0.56	1.00	19.00	0.50	-0.23
Proposal	0.00	1.00	0.26	0.00	9.00	0.45	1.02
KS	0.00	1.00	0.71	1.00	24.00	0.46	-0.86
Roadmap	0.00	1.00	0.56	1.00	19.00	0.50	-0.23
Events	0.00	1.00	0.68	1.00	23.00	0.47	-0.72
Discord*	1.22	5.38	3.91	3.95	133.10	1.00	-0.94
Drop	0.00	1.00	0.41	0.00	14.00	0.50	0.34
Spec	0.00	1.00	0.38	0.00	13.00	0.49	0.46
Vetting	0.00	1.00	0.50	0.50	17.00	0.51	0.00
Affiliate	0.00	1.00	0.26	0.00	9.00	0.45	1.02
Primary	0.00	0.18	0.06	0.04	1.94	0.05	0.82
Secondary	0.00	0.10	0.03	0.03	0.90	0.02	1.64
Royalty	0.01	0.66	0.16	0.10	5.52	0.18	1.59
Auction	0.00	1.00	0.71	1.00	24.00	0.46	-0.86
Aggregator	0.00	1.00	0.26	0.00	9.00	0.45	1.02
Launchpad	0.00	1.00	0.44	0.00	15.00	0.50	0.23
FiatC	0.00	1.00	0.50	0.50	17.00	0.51	0.00
InformD	0.00	1.00	0.62	1.00	21.00	0.49	-0.46
Blockchain	1.00	9.00	2.24	1.00	76.00	2.18	1.92
Wallet	1.00	14.00	4.82	4.00	164.00	3.26	1.00

*Note: * Log-transformed*

4.3.4.2 Correlation Analysis

Given that some facets may be related to each other in marketplace design, multicollinearity may exist in the variables, leading to unstable estimates and results. To capture the linear relationships among the variables, a correlation analysis was conducted between the variables to detect the multicollinearity phenomenon that may exist in the above-mentioned variables. Figure 6 visualizes the results of the correlation test among the variables. Typically, a darker color indicates a stronger relationship between two variables. We identified the presence of multicollinearity in variables from the correlation plot, as evidenced by dark spots both in blue and red color. Hence, in the next step, we focused on further refining the dataset using factor analysis.

Figure 6: Variable correlation plot
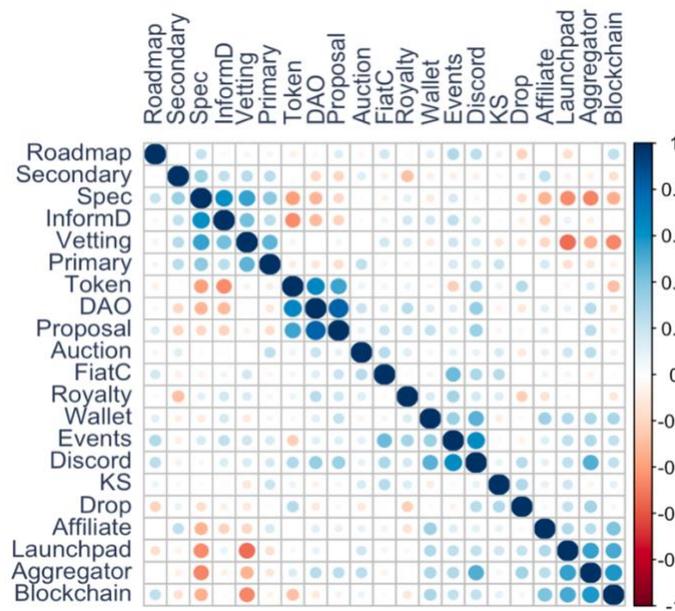
4.3.5 Factor Analysis

Because multicollinearity exists among the former independent variables, it causes the model to be unstable and unreliable. Additionally, having 21 variables is excessive for a small dataset that includes only 34 samples. Conducting a regression analysis with this setup would likely result in overfitting to the original dataset, rendering the results potentially unworkable with other data. Thus, Factor Analysis was conducted to deal with such issues.

4.3.5.1 Hypothetical Model for Exploratory Factor Analysis (EFA)

Other than the multicollinearity observed from the correlation analysis above, the dataset has a relatively large set of variables given the number of observations. There are 34 observations, but we identified 21 independent variables through the exploration. The number of variables was relatively high compared to the quantity of observations, calling for the necessary data processing to prepare for the subsequent regression analysis.

For multivariate data analysis, Exploratory Factor Analysis (EFA) is a common variable reduction technique (Morikawa et al., 2016), which allows to identify latent constructs underlying a set of variables. Especially, compared with other factor analysis techniques such as Principal Components Analysis, EFA is appropriate for reducing the data from multiple variables into fewer variables that are representative of the larger variable group (Williams et al., 2010). It extracts factors from the initial set of variables to provide an explanation of the raw data and the relationships within them (Chumney, 2012).

Therefore, to refine the dataset from the original correlated variables and uncover the underlying relationships among the independent variables regarding NFT marketplace design, we chose to use EFA subsequently.

A hypothetical model of EFA built on the dataset for this study can be found in Figure 7. A positive loading λ indicates a positive relationship, while a negative loading λ indicates a negative relationship. The absolute value of the loading λ indicates the strength of the relationship. Following the advice of Hair et al (1998), loading scores (absolute value) greater than 0.5 are considered stable. Thus, we set the following factor loading criteria: $\lambda \geq 0.5$ indicating strong positive association; $0 \leq \lambda < 0.5$ indicating weak positive association; $-0.5 \leq \lambda < 0$ indicating weak negative association; and $\lambda < -0.5$ indicating strong negative association. In this model, potential factors (from Factor 1 to X) are linked to different clusters of initial independent variables regarding marketplace design (Df groups 1 to X). By assessing the variables that are grouped together, we can conclude the essence of each factor. It's important to

note that there can be relationships between factors, and both negative and positive associations of one factor with several Df groups.

Figure 7: A hypothetical EFA model
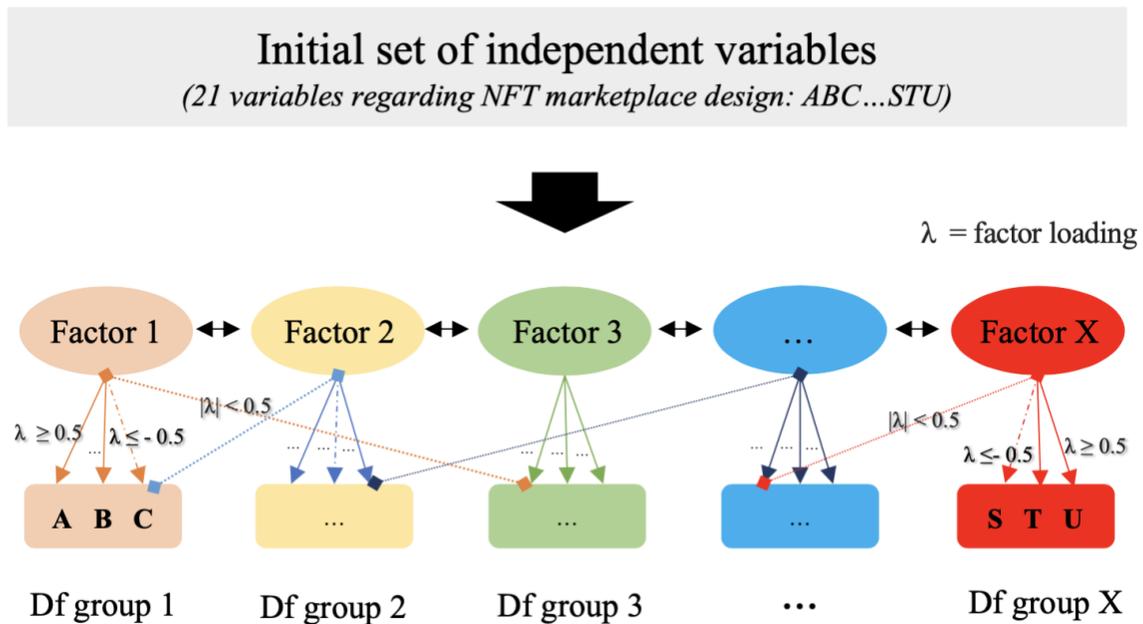
Note:

● *21 initial independent variables are clustered into X groups based on strong associations ($\lambda \geq 0.5$: strong positive association; $0 \leq \lambda < 0.5$: weak positive association; $-0.5 \leq \lambda < 0$: weak negative association; $\lambda < -0.5$: strong negative association), and latent factors 1 to X are extracted.*

● *↔ suggests there can be associations between factors.*

4.3.5.2 Parallel Analysis

In the initial stage of Exploratory Factor Analysis, one key decision is how many factors to retain. Parallel Analysis is a simulation-based approach to help make this decision (Hayton et al., 2004). A parallel analysis was conducted to determine the number of factors for this study. The result of parallel analysis, a scree plot, is depicted in Figure 8. The triangular line represents real data, while the dashed line represents simulated data after 100 simulations. Typically, it is

advisable to retain factors in the scree plot before the elbow point to effectively screen the main factors. Additionally, we referred to two other common criteria: retaining factors with eigenvalues greater than 0 and those above the dashed line. These criteria ensure that factors explain the most variance in the entire dataset. According to the criteria, we could find there are three factors before the elbow point, and there are also the same three factors with eigenvalues higher than the simulated data, while there are eight factors with eigenvalues greater than 0. Besides, RStudio suggested that three factors should be extracted in this Parallel Analysis. In the end, we decided to extract three factors from the original set of variables.

Figure 8: Parallel analysis result
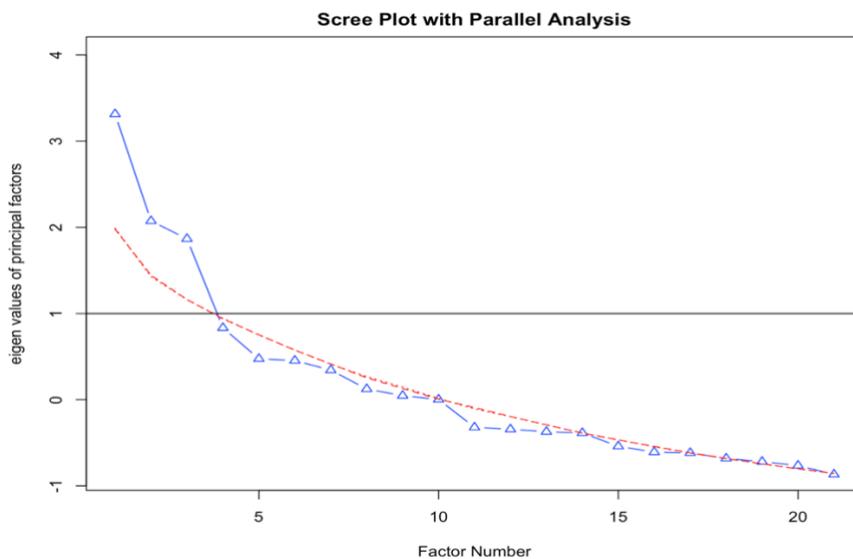
Note: Parallel analysis suggests that the number of factors = 3

4.4.5.3 Factor Rotation

In factor analysis, it is common to use several factors to explain the dataset. However, these factors may often exhibit high correlations with each other. This can lead to results that are unclear and difficult to interpret. Therefore, factor rotation is essential for understanding the data structure and ensuring that factors align with the variance they explain.

Currently, two common methods for factor rotation are orthogonal rotation and oblique rotation (Sass. and Schmitt., 2010). Orthogonal rotation means that in the factor space, the factors are

orthogonal or uncorrelated with each other. Oblique rotation allows for some degree of correlation between the factors. While orthogonal rotation can provide a clearer explanation of the data structure, it also increases the complexity of calculations.

In our study, it turned out that there exist correlations among 21 variables according to the previous correlation analysis. Hence, 3 factors arising from these variables are highly likely to be interrelated. As a result, we chose to conduct the oblique rotation to continue our factor analysis, allowing for some degree of correlation between factors. Additionally, we utilized Bartlett's factor scores, computed using the weighted least squares method, to assign scores to the observations. From this data processing, we got factor loadings and the score of each observation within each factor.

4.4.5.4 Factor Loadings

The factor loadings can help explore the correlation clustering in 21 variables. They serve as indicators of the impact of the common factors shared among two or more variables and showcase the strength of the relationship between each variable and the underlying factors. Figure 9 illustrates the outcomes of the factor loadings. Initial variables were clustered into groups based on their highest loadings. For instance, variables like *DAO*, *Proposal*, and *Token*, depicted as blue points, consistently clustered together due to their highest loading in Factor 2.

Figure 9: Factor plot
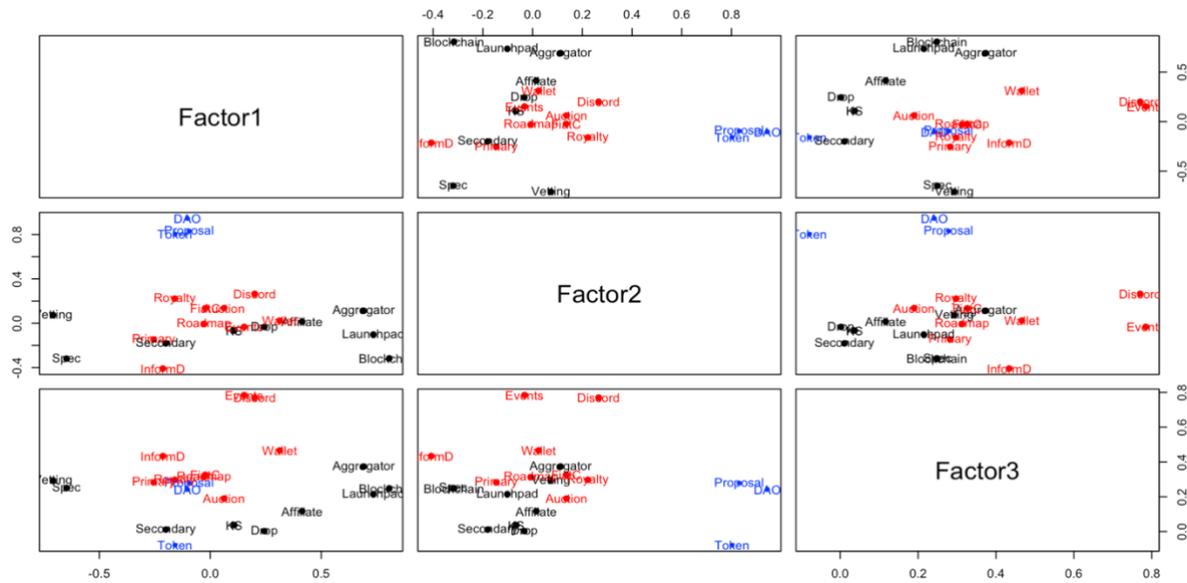
In this study, factor loadings greater than 0.5 were selected as related variables forming the particular factors, as shown in Figure 10. We noticed that the variables assigned to each factor shared a common theme in each group, as indicated in Table 4. Factor 1 was named *Transaction Structure*, which can primarily be explained by *Blockchain* (number of blockchains based on), *Launchpad* (sellers can launch their own marketplaces or not), *Vetting* (creators need to be vetted or not), *Aggregator* (with an aggregator or not), and *Spec* (Specialized or not). Factor 2 was about *Community Governance*, consisting of *DAO* (DAO or not), *Proposals* (with historical proposals or not), and *Token* (with a native token or not). Factor 3 can be explained as *Community Engagement*, which is composed of *Events* (hosting community events or not) and *Discord* (number of Discord members). In conclusion, the initial variables became indicators for our new variables (factors), which are *Transaction Structure*, *Community Engagement*, and *Community Governance*, and the following regression analysis was conducted based on three new variables.

Figure 10: Visualizing Oblique Rotated Factor Analysis
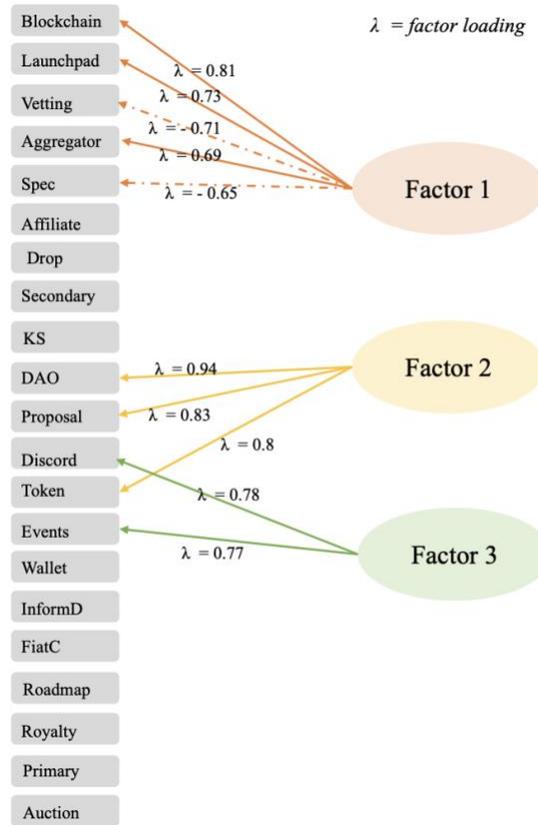
Table 4: New variables with indicators and loadings

Variables					
Transaction Structure (TS, Factor 1)		Community Governance (CG, Factor 2)		Community Engagement (CE, Factor 3)	
Indicators	Loadings	Indicators	Loadings	Indicators	Loadings
Blockchain	0.81	DAO	0.94	Events	0.78
Launchpad	0.73	Proposals	0.83	Discord	0.77
Vetting	-0.71	Token	0.80		
Aggregator	0.69				
Spec	-0.65				

Meanwhile, Bartlett's factor scores for the original samples served as values for these three new variables. Figure 11 depicts the samples scored by these three factors. These factor scores represent the projections of the original data points onto factors, that is, Factor 1, 2, and 3.

Figure 11: 3D visualization of sample scores
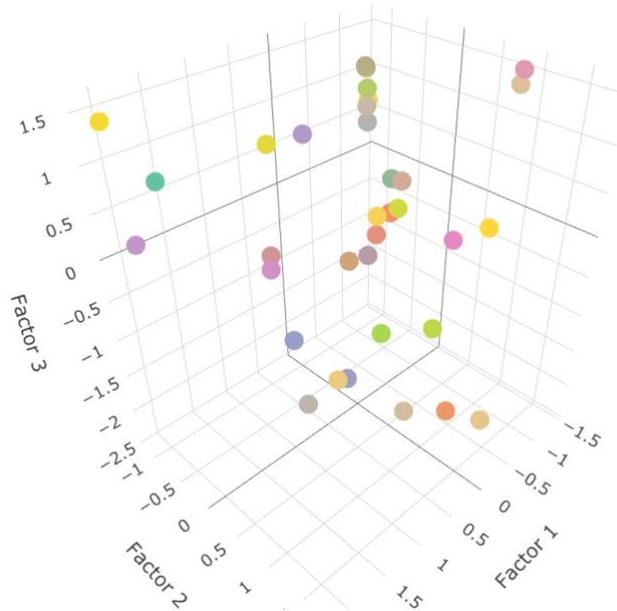
4.3.6 Regression Analysis

4.3.6.1 Regression Model

Based on the introduction of new variables, we subsequently introduced *Model 1* to further investigate the relationship between the NFT marketplace design and fundraising ability.

$$Funding_i = \alpha_i + \beta_{i,TS} * TS_i + \beta_{i,CG} * CG_i + \beta_{i,CE} * CE_i + \epsilon_i \qquad (1)$$

4.3.6.2 Descriptive Statistics

In order to further understand the central tendency and dispersion of our dataset, we summarized descriptive statistics on new variables (Table 5).

Table 5: Summary statistics of new variables

	Funding	**TS**	**CG**	**CE**
N	34.00	34.00	34.00	34.00
Minimum	-0.92	-1.42	-1.19	-2.41
Maximum	6.06	2.12	1.78	1.56
Mean	1.73	0.00	0.00	0.00
Median	1.59	0.12	-0.29	0.27
Sum	58.79	0.00	0.00	0.00
Stdev	1.31	1.06	1.04	1.08
Skewness	1.16	0.20	0.41	-0.52

The mean values for CG, CE, and TS are all 0, consistent with the common practice of mean-centering factor scores in factor analysis. Since these factor scores were derived using Bartlett's approach, a mean of 0 suggests that the factor scores do not introduce a systematic bias in the original variables.

TS and CG both exhibit skewness below 0.5, indicating a slight rightward skew and a slightly longer right tail in the distribution. CE, with skewness around -0.5, indicates a slight leftward skew. However, the skewness is relatively small, suggesting a relatively symmetric distribution. Funding is log-transformed to bring its distribution closer to the normal distribution compared to the raw data. With skewness values all below 2, suggesting a relatively symmetric distribution, it is reasonable to believe that the data is stable and informative.

4.3.6.3 Correlation Analysis

Table 6: Correlation matrix with the IVs and the DV

	Funding	**TS**	**CG**	**CE**
Funding	1	0.397	0.208	0.430
TS	0.397	1	0.274	-0.112
CG	0.208	0.274	1	-0.121
CE	0.430	-0.112	-0.121	1

We performed a correlation analysis for three new variables and simultaneously used the Variance Inflation Factor (VIF) to detect whether there still exists multicollinearity in Model 1.

Table 6 shows the correlation coefficient between independent variables are all below 0.3, suggesting a weak or negligible correlation between IVs. And the correlation coefficient between *Funding* and *TS* and coefficient between *Funding* and *CE* are around 0.4, indicating a possible relationship inside them.

Meanwhile, for the VIF approach, the higher the VIF value is, the more severe multicollinearity issue exists. Values greater than 10 indicate a multicollinearity problem. On the other side, VIF that equals 1 means that variables are not correlated. Table 7 reveals that the three independent variables all have VIF values round 1, which means they are slightly correlated, and the regression model is stable and reliable. We thus continued the regression analysis using this model.

Table 7: The result of VIF

TS	CG	CE
1.088	1.091	1.022

4.3.6.4 Regression Results

Table 8 summarizes the regression results of Model 1. The coefficient for TS is 0.504, and the associated p-value is 0.009, indicating that the *TS* variable is statistically significant at the 99% confidence level and positively associated with the dependent variable *Funding*. Based on the analysis for indicator loadings in Table 5, it turns out that indicators *Spec* and *vetting* are negatively associated with *Funding*, while *Blockchain*, *Aggregator*, and *Launchpad* have a positive correlation with *Funding*. Similarly, variable *CE* is also significant at the 99% confidence level and positively associated with the dependent variable *Funding*. Both indicators *Events* and *Discord* exhibit positive indicator loadings, indicating a positive correlation with the dependent variable *Funding*. On the other side, variable *CG is* not statistically significant in explaining the dependent variable Funding.

Table 8: Regression results of Model 1

	Estimate	Std. Error	t value	Pr(>|t|)	
TS	0.504	0.181	2.793	0.009	***

CG	0.195	0.184	1.062	0.297	
CE	0.597	0.172	3.480	0.002	***

Note： $*p < 0.1$; $**p < 0.05$; $***p < 0.01$

Residual standard error: 1.055 on 30 degrees of freedom

Multiple R-squared: 0.4075, Adjusted R-squared: 0.3483

F-statistic: 6.878 on 3 and 30 DF, p-value: 0.001161

4.4 Findings and Further Steps

Study 1 identified the correlation between NFT marketplace design and the platform fundraising ability. TS (Transaction Structure) and CE (Community Engagement) are associated with Funding, while CG (Community Governance) does not have a significant effect on Funding.

Specifically, for Transaction Structure, focusing on diversified NFT assets, not adopting a vetting process, having an aggregator, having a launchpad, and supporting multiple chains can help the marketplace attract more funding. When it comes to Community Engagement, more community members and hosting events are associated with higher funding for the NFT marketplace.

However, Community Governance barely has an impact on the platform's fundraising ability. Although it is a popular topic in the Web 3.0 world because blockchain technology has enabled the decentralization of governance, Community Governance turns out to be an insignificant factor for NFT marketplace fundraising.

To understand the possible mechanisms underlying the results identified, a multiple case study was conducted to complement Study 1.

5. Study 2

5.1 Sampling

The study applied three criteria to determine the selection of sample marketplaces: (i) Representative; (ii) Comparable; and (iii) Contrasting.

First, given that the unit of analysis plays a critical role in the case study to showcase a system of action rather than an individual or group of individuals (Tellis, 1997), we aimed to find two representative cases in the NFT industry. Specifically, based on 34 samples in Study 1, we selected an initial sample of 12 marketplaces that were founded before 2021, which have withstood the test of time and are more likely to be representative due to the first mover advantage.

Second, to identify comparable cases in terms of financing amounts, we excluded OpenSea from the initial sample due to its total funding amount significantly deviating from the average amount compared to the others.

Last but not least, to comprehend the mechanisms underlying the results of Study 1, we screened all 11 marketplaces from the previous step to find two contrasting cases that differ in Transaction Structure, Community Engagement, and Community Governance throughout their fundraising journey. This comparison between the two cases can help understand the relationships between certain features and the fundraising ability. Furthermore, it provides a valuable perspective into explaining why Community Governance does not correlate with fundraising ability. In the end, SuperRare and Rarible turned out to be a pair of suitable focal marketplaces.

5.2 Focal Marketplaces

The founding teams of both focal marketplaces were early adopters with involvement in blockchain. SuperRare was founded in 2017 by John Crain, Charles Crain, and Jonathan Perkins. The team has a background in both blockchain and art. John was intrigued by blockchain technology and joined an Ethereum-based firm in 2013 after personal Bitcoin investments; Jonathan, with a digital media degree, shared a passion for art and blockchain expertise; and Charles, a software engineer with traditional art industry experience, rounded out the trio. Rarible marketplace was officially launched in early 2020 by Alexander Salnikov and Alexei Falin. Alex Salnikov has been a crypto-native since his university days when he built one of Web 3.0's first crypto-fiat exchanges. During the Ethereum and Bitcoin boom, he dived into understanding smart contracts and white papers, which prepared him for the 2017 cryptocurrency

surge. Alex's journey eventually led him to meet Alexei Falin who is a serial entrepreneur and also an early proponent of blockchain technology, and together, they founded Rarible.

Both SuperRare and Rarible started small with a tool for NFT creation and later expanded their ambitions. At the early stage of SuperRare, John and Jonathan developed a transformative tool that allowed content creators to seamlessly turn their Instagram posts into NFTs on the SuperRare platform. The founders, recognizing the need for broader industry appeal, soon expanded their scope beyond Instagram and set out to create an NFT platform catering to the fine art industry. Similarly, Rarible initially focused on creating a tool to assist users in creating NFTs. As the two founders dived deeper into the world of NFTs, trading and using NFTs, they discovered the vast potential for innovation in this nascent market and decided to launch an NFT marketplace.

In general, SuperRare and Rarible share many similarities and these many similarities can mitigate plausible alternative explanations that are not of theoretical interest in the following comparative analysis between SuperRare and Rarible. Firstly, both platforms emerged as early entrants that began before the phenomenal year 2021 and have since evolved into prominent players in the NFT industry. Secondly, all of their founders were early participants in the Web 3.0 ecosystem, guiding both platforms along a trajectory from an NFT creation tool to a big business scope. Thirdly, both founding teams kicked off seeking investments shortly after establishing their respective marketplaces.

The key difference that we explore is the different platform designs for each. As for Transaction Structure, Rarible has introduced an aggregator feature to provide a wide and comprehensive selection of NFTs, allowing users to browse and purchase NFTs from various marketplaces on a single page, thereby simplifying users' selection process. Furthermore, Rarible has launched an enterprise marketplace launchpad called RaribleX, which allows Web 2.0 brands to enter the Web 3.0 landscape without incurring substantial technical expenses. There is also another marketplace builder on Rarible for individual users to launch their own marketplaces. Rarible also collaborates with multiple blockchains, enabling users to buy or create NFTs based on their preferred blockchains. Notably, Rarible does not have a vetting process, meaning that anyone

who signs up can become a creator on Rarible, and it serves as a marketplace for diverse types of NFTs. Differently, SuperRare is an NFT art marketplace for fine art. It employs a rigorous vetting process for artists to ensure the high artistic value of listed artworks and to discover non-mainstream talents, thereby ensuring the rarity of the artworks. Unlike Rarible, SuperRare is exclusively built on the Ethereum blockchain and does not have an aggregator or a marketplace launchpad.

For Community Governance, although both marketplaces now have adopted a DAO governance structure, they were different during each marketplace's fundraising journey. Rarible started building up this decentralized governance model by issuing its native token $RARI in 2020 before its first funding. While SuperRare did not work on decentralized governance until 2021, it issued $RARE token and switched to a DAO after its latest funding.

When it comes to Community Engagement, Rarible has approximately 1.5 times the number of Discord members compared to SuperRare, and both of them host community events.

Table 9 summarizes.

Table 9: Focal Marketplaces

	Rarible	SuperRare
Founding Year	2020	2017
Total Funding	$15.95 million*	$10.4 million
Blockchain	Polygon, Ethereum, Tezos, and Immutable	Ethereum only
Launchpad	RaribleX, an enterprise launchpad for Web 2.0 brands that want to enter NFT industry & a marketplace builder for individual users	None

Vetting	None	A strict vetting process, onboarding only a few artists each month
Aggregator	Aggregating transaction information from over 10 marketplaces	None
Spec	Not specialized	Specialized in the category of fine art
DAO	Rarible DAO from 2020	SuperRare DAO from 2021
Proposals**	138 proposals until Sep 2023	68 proposals until Sep 2023
Token	$RARI token issued in 2020	$RARE token issued in 2021
Events	Online events, e.g., Open Editions event	Online events, e.g., Art contest & Offline events, e.g., Community meet up
Discord	53359 Discord members	34682 Discord members

Undisclosed funding amount for Rarible's pre-seed round was not counted in.

***Data for the number of Discord members was collected on 25th Sep 2023.*

5.3 Data Collection

We collected data from archival materials, including news media, existing interviews with platform founders and their investors, corporate sources, a teaching case, investment memos, and investment theses for focal companies. Such varied data sources offer triangulation among them, enhancing overall accuracy (Eisenhardt, 1989; O'Mahony & Bechky, 2008).

To learn about the founding stories of Rarible and SuperRare, we collected data from both marketplaces' blog posts and interviews with their founders, mainly existing in the format of Podcasts and YouTube videos, from which we found the platforms' value propositions along with the founders' background information.

Moreover, the archival data collection was conducted throughout the study with a focus on platforms' development over the years since they were founded. To draw a picture of the journey for each marketplace, we read all the articles published by the two marketplaces' official accounts on Medium, which is a popular content distribution platform among blockchain projects (GrowthChain, 2021) and where both marketplaces posted their visions and missions, platform feature updates, weekly/yearly reviews, and press releases about fundings they

managed to raise. Concerning the community governance of each platform, we browsed all proposals within each DAO community to observe the decision-making processes, focusing primarily on Rarible, as SuperRare was not operating as a DAO during the period under study.

We mainly used CoinCarp and focal marketplaces' press releases to outline the funding timeline for each focal marketplace. Google helped us to navigate through potential related sources and we read all the articles covering information about focal companies' fundraising. The press releases published by the focal marketplaces upon securing funding typically include a review of the platform's past performance, outline their future steps, and provide brief explanations about why they think they can secure the funding. Some press releases also contain quotes about the platform from investors in the corresponding funding round. We also leveraged two investment memos, one for each marketplace, an investment thesis for Rarible from its pre-seed round investor Coin Fund, an investment report for SuperRare from a cryptocurrency investment research platform Token Metrics, other relevant articles written by investors, and relevant third-party interviews with investors regarding the investment on the focal marketplaces. Furthermore, a teaching case from Harvard Business School (HBS), co-authored by Jeffery J. Bussgang who was an investor in the venture capital firm 1confirmation which was a SuperRare investor, mapped out the financing journey of SuperRare in a detailed manner, injecting valuable insights for our case study on SuperRare.

5.4 Data Analysis

According to theory-building from multiple case methods (Eisenhardt & Graebner, 2007), our multiple case study started by preparing firm histories for each focal marketplace. By combining third-party interviews with the two founding teams and the regularly updated blog articles of each on Medium, supplemented by the HBS case, we analyzed the development of each NFT marketplace from the inception alongside the financing journey. As a result, the different value propositions of two focal marketplaces were clearly identified and their respective financing journeys were outlined during this process.

To conduct a multi-perspectival analysis which requires considering the voice and perspective of not only actors but also relevant groups of actors (Tellis, 1997), investment memos, the investment thesis and the investment report, investors' articles, and interviews about focal

marketplaces from investors' perspectives helped identify the determinant factors when it comes to the investment on an NFT marketplace, completing the platforms' subjective explanations for successfully raising fundings in their press releases. Especially, the investment memo for Rarible by Elise Decamp from Bloomberg Beta, a venture capital firm that did not end up investing in Rarible, presented critical perspectives that can complement the opinions of other venture capital firms that did invest in Rarible.

5.5 Financing Journey

5.5.1 SuperRare

SuperRare's founders started approaching investors in late 2018. Prior to this, the founders had bootstrapped the company without salaries and worked on consulting projects to sustain themselves (Bussgang et al., 2022). Even though they were optimistic about their ability to raise funds at the beginning, the belief soon turned out to be false. Undeterred, the founders persisted in improving the platform, focusing on infrastructure development, and actively approached over 150 investors in 2019. Unfortunately, these efforts did not yield the desired interest from investors. The pivotal turning point came in 2020, as the COVID-19 pandemic accelerated the digital shift in the art industry. Benefiting from this, SuperRare experienced a surge in sales and finally closed a seed round of $1.4 million in September 2020.

In March 2021, SuperRare raised $9 million in Series A. During the fundraising process, the SuperRare team connected with Michael Lazerow, a serial entrepreneur and former Salesforce executive who co-founded the venture capital firm Velvet Sea. Lazerow was impressed by SuperRare's business model, capital efficiency, and engaged community (Bussgang et al., 2022). Subsequently, Velvet Sea led the Series A round and Michael Lazerow joined the SuperRare Labs board.

5.5.2 Rarible

Unlike SuperRare's bumpy fundraising journey, Rarible's was much smoother. In September 2020, only several months after it was launched, Rarible initiated its financing journey with an undisclosed amount in a pre-seed round, backed by New York-based blockchain investment firm CoinFund. This initial injection of capital laid a solid foundation for Rarible to further grow the

platform. Just five months later, in February 2021, Rarible took a significant step forward by securing a $1.75 million seed round. This round was led by 1kx and joined by notable investors, including ParaFi Capital and Coinbase Ventures. This marked one of the earliest major seed rounds in the NFT space (Rarible, 2021a), supported by top crypto investors. Rarible's vision to foster direct relationships between digital content creators and buyers was further strengthened with the involvement of angel investors, including Loi Luu and Donna Redel. The journey continued in June 2021 when Rarible raised a substantial $14.2 million, with participation from Venrock Capital, CoinFund, and 01 Advisors, aimed at advancing the digital creator economy into the mainstream (Rarible, 2021b).

5.6 Proposition

This section relies on the theoretical propositions in this section to guide the analysis (Tellis, 1997) where we adopted a pattern-matching technique (Trochim, 1989; Yin, 1994) to compare the empirically based patterns with the predicted ones, namely, the propositions.

Following deductive logic, the authors formulated propositions primarily based on the literature on venture capital investment, which emphasizes that the growth potential and stability of a venture are two key factors in venture capital investment strategy (Beckert, 2013). Extending this logic to the context of the NFT marketplace, the fundraising ability of NFT marketplaces may be influenced by both the growth potential of these marketplaces and investors' assessments of future uncertainties.

In particular, to elucidate why Transaction Structure and Community Engagement can influence NFT marketplaces' fundraising ability, Proposition 1 seeks to establish the connection between the growth potential of the marketplace and platform design. To clarify why Community Governance does not influence the fundraising ability of the platform, Proposition 2 delves deep into the uncertainties surrounding the new governance model and the competitive dynamics among different NFT Marketplace incumbents.

5.6.1 Proposition 1

Proposition 1: Divergent platform visions lead to varied transaction structures and sizes of engaged communities, shaping distinct growth potentials that investors evaluate and consider in their investment decisions within the NFT marketplace landscape.

Figure 12: Proposition 1
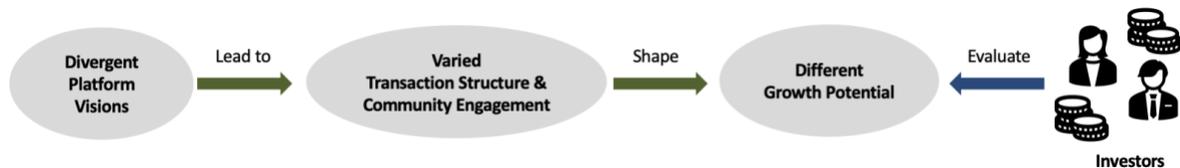
5.6.1.1 Vision and Action

By building up a niche marketplace, the founders of SuperRare believe that their brand with an emphasis on high-end digital art will attract a different set of users compared with all-around NFT marketplaces, e.g., OpenSea. Specifically, they aim to build a platform that can spark unique and innovative perspectives in the field of digital art, rather than being a marketplace for all types of NFTs. Different from SuperRare's ambition within the fine art category to be a premium brand, Rarible's vision has always revolved around mass adoption and accessibility since its birth. Although Rarible initially gained prominence within the digital art community, it quickly expanded its offerings to encompass a wide array of assets, including in-game items, metaverse lands, and DeFi insurances (Rarible, 2020), which demonstrated Rarible's desire to diversify its user base and accommodate a broader spectrum of NFT use cases.

To establish a premium brand and ensure the rarity of the collections, SuperRare adopts a strict vetting process and keeps discovering non-mainstream artists. Artists who wish to join SuperRare must submit an application video introducing themselves and their artworks, along with several individual works accompanied by detailed stories behind each work. This meticulous curation process ensures that only exceptional and genuine artworks are listed on the marketplace, maintaining the rarity and the artistic value of the collections. In contrast, to create an open market where everyone can create their NFTs, Rarible does not adopt a vetting process for creators. However, it is noteworthy that Rarible has been strengthening the identity

verification process for users, trying to eliminate fraudulent transactions and create a safe and open marketplace. By removing barriers to NFT creation and focusing on verification, the platform aims to make participation in the NFT ecosystem more inclusive and accessible. To accomplish its vision of moving forward toward mainstream Web 2.0 audiences outside the crypto world, the marketplace has been simplifying onboarding for users with limited or no crypto experience. For example, Rarible provides systematic and detailed guidelines for users to get involved and has supported credit card transactions since September 2021.

In addition to serving as a user-friendly open marketplace, Rarible strives to become a full-scale protocol and encompass a role as a toolbox for NFT marketplaces, providing a more comprehensive NFT experience. Its aggregator enables users to have a one-stop "shopping" experience by aggregating transaction information from multiple NFT marketplaces all at the same place. Besides, its marketplace builder and enterprise NFT launchpad allow individuals and Web 2.0 brands to establish their own NFT marketplaces. Different from Rarible broadening its scope to be versatile and to reach more audiences, SuperRare is dedicated to improving its within-community curation and collection experience. Although it does not have an aggregator or a launchpad, SuperRare has introduced SuperRare Spaces, which are standalone digital galleries on the SuperRare platform to curate and exhibit the artworks of artists who are nominated by the SuperRare community.

Both marketplaces have accumulated a large user base over the years and built online communities on Discord where users can be more engaged in platform activities and peer discussions. Various events have been organized to enhance community engagement. Although Rarible was founded later than SuperRare, Rarible has 1.5 times the number of Discord members compared to SuperRare, which holds a community that is highly dedicated to fine art.

5.6.1.2 Investors' Consideration

5.6.1.2.1 SuperRare

Although SuperRare managed to attract investment at the end, its value proposition did not bring investment attractiveness at the beginning. After several unsuccessful attempts to attract investor interest, it wasn't until early 2020, more than two years after its founding, that SuperRare finally

secured its $1.4 million seed round funding led by 1confirmation. This success was largely attributed to SuperRare's substantial traction and growth during the NFT wave at that time.

One of the youngest general partners in crypto venture capital, Richard Chen at 1confirmation, talked about two determinants for him to make the investment decision for SuperRare in an interview (RealVision, 2021). First, although the sales volume of SuperRare was still small at that time, the growth rate was quite high, around 50% month by month. Richard believed this growth rate would potentially lead to a massive sales volume in the end. The second thing that drew Richard's attention was that SuperRare had a super passionate early community of users. He believed this is how NFT marketplaces can get the product-market fit from having a sticky user base. In the investment memo provided by 1confirmation (2020), more details were provided regarding the community engagement factor. *"Superior design, product, and curation have enabled the platform to attract a strong community of the highest quality artists and most important collectors, and we believe this will persist over time."* An engaged community of SuperRare proved that SuperRare has built the right solution for satisfying users' demands.

Similar considerations were mentioned in SuperRare's A round in which SuperRare secured $9 million. Michael Lazerow from the venture capital firm Velvet Sea which led this round of funding, pointed out that SuperRare possessed the qualities, e.g., an engaged community, that attract investors.

In the case of SuperRare, its positioning plays a pivotal role in shaping its transaction structure design and bringing it an engaged community dedicated to fine art. It was only after demonstrating a compelling growth rate within its specific niche category that the platform generated attractiveness for potential investors. Meanwhile, its actively engaged community served as a persuasive factor, assuring investors that Rarible is a sound product-market for its niche market. This convincing growth trajectory coupled with the community engagement, instilled confidence among investors regarding SuperRare's substantial growth potential in the future.

5.6.1.2.2 Rarible

Compared to SuperRare's investors, who waited until proven market growth occurred in this niche category, Rarible's investors demonstrated alignment with Rarible's vision for an accessible open marketplace and expressed their belief in the market potential alongside this broad vision, even when the platform was still in its initial phase.

Only several months after Rarible's launch, in the pre-seed round closed by CoinFund in September 2020, Rarible successfully attracted substantial investments from reputable firms and investors who shared a common vision for the mass adoption and accessibility of NFTs. Jake Brukhman, CEO and founder of CoinFund, in CoinFund's blog article *"All digital content is going on-chain"* (2020), shared CoinFund's NFT investment thesis and talked about the pre-seed round investment decision in Rarible. CoinFund showed a strong belief in a future for diversified NFTs. He wrote, *"The market holds an inconspicuous secret: there is a staggering diversity of online digital content that can be placed on a blockchain in the form of NFTs."* Rarible has positioned itself and envisioned a future aligned with this investor's belief since its birth and since the "secret" was still inconspicuous. Brukhman also expressed excitement about supporting Rarible's *"crypto native approach"* and *"versatile competencies"* amid the evolving NFT landscape, showcasing confidence in Rarible's ability to compete effectively in the NFT marketplace landscape. Meanwhile, he mentioned that Rarible had made continuous efforts to create a well-integrated tool to improve the user experience for both crypto natives and mainstream users, and top-notch tools can effectively attract and engage users. This customer-centric approach won Rarible a significant number of users, and many of them took the step to join the online community for more engagement.

The subsequent $1.75 million seed round in February 2021 further solidified investor support. Investment firms such as ParaFi Capital, Coinbase Ventures, and MetaCartel Ventures recognized Rarible's role in tokenizing assets in gaming, art, music, and finance, underscoring the platform's versatile nature and broad market potential. Anjan Vinod from ParaFi Capital emphasized Rarible's emergence as a leading marketplace, praised its community for its impressive growth in users, and expressed his belief in the future of diversified digital assets and mainstream NFT adoption (Rarible, 2021a). He said, *"We believe all types of assets across*

gaming, art, music, and finance will become tokenized and We are excited to support Rarible on their journey to bring NFTs to the masses." Elise DeCamp (2021) from Bloomberg Beta shared similar thoughts in her investment memo on Rarible although Bloomberg Beta was not one of the investors. She highlighted Rarible's unique position as a platform for diverse NFT types and agreed with this strategic move to tap into the expanding demand for digital assets, believing that this broad vision can bring impressive growth to the platform. She wrote, *"While there has been a huge rise in NFT marketplaces for art, I think Rarible is interesting as they've positioned themselves as a platform for all the different NFT types- domain names, insurance, photography, 3D models, you name it. They are just getting started."*

Rarible did not disappoint these investors. By June 2021, Rarible's total trading volume had grown by 3000 times compared to the same period in 2020, reaching $150 million in total sales (Rarible, 2021c). Its monthly active users were 2.1 million and around 100k users engaged in its Discord community at that time (Rarible, 2021c). At this milestone, another round of funding from Venrock Capital, CoinFund, and 01 Advisors injected $14.2 million into the platform to fuel its journey to mainstream user applications.

In Rarible's case, its vision for a broad market led to its transaction structure design strategically catering to a wide and diverse user base. This vision and the corresponding design choices made investors believe in the platform's expansive growth potential, a belief that ultimately turned out to be true. Moreover, the platform's emphasis on accommodating a large user base resulted in the development of a large, engaged community. This considerable user engagement not only showcased the platform's appeal to users but also served as evidence of its strong product-market fit, reinforcing its attractiveness for investors.

5.6.1.3 Conclusion

Comparing SuperRare with Rarible, though both marketplaces managed to attract investors in the end, the fundraising processes for each were not the same straightforward and the amounts raised also showed big differences. SuperRare took much longer than Rarible to secure funding, and it also received less capital compared to what Rarible obtained. During the fundraising,

investors adopted different approaches to assess the growth potential to make investment decisions.

It is evident that when an NFT marketplace's vision is about a broad market, investors often cite the vision as their investment rationale to show their belief in the platform's potential for substantial growth from a vast and diverse user base, even in the early phases of the platform. In contrast, when an NFT marketplace targets a specific niche group of users, investors tend to wait until they witness tangible growth within this specific niche category before becoming convinced of its potential for growth. Moreover, larger funding amounts tend to gravitate toward marketplaces with a broader market focus, proving investors' stronger confidence in its growth potential.

In conclusion, the investment decisions for NFT marketplaces are largely driven by the potential growth of the platform, just as in the Web 2.0 world, and the growth potential of an NFT marketplace is influenced by the platform vision and positioning which give rise to its certain platform design.

5.6.2 Proposition 2

Proposition 2: A new community governance model is not an inimitable competitive advantage from investors' perspective, and its untested nature leaves the potential to generate returns uncertain for investors.

Community governance has been a buzz topic in Web 3.0 for a very long time because blockchain technology makes the vision for a decentralized future vivid and possible. The relevant discussions always underscore a multitude of perceived advantages envelop a decentralized governance model, notably encompassing heightened transparency, democratization, and inclusivity. Many individuals espouse the belief that decentralized governance constitutes an inexorable trend for the evolution of Web 3.0.

The common approach for NFT marketplaces to adopt a new decentralized community governance structure usually starts with issuing a platform native token and gradually transforms

the marketplace into a DAO. Token holders can vote towards community proposals to make the decisions for the platform's development based on the consensus. Voting under this governance structure typically involves token-based voting, where each member's voting power is proportional to the number of tokens they hold.

Rarible and SuperRare have both adopted this new community governance model now though they decided to implement it at different stages of their respective journeys. With the trend of decentralization in the broader context, Rarible was a trailblazer in exploring a new governance approach by issuing the first governance token $RARI in the NFT space in 2020 before its pre-seed funding round and Rarible took this move as its first step in creating a DAO. As for SuperRare, it chose to adopt this governance model after its latest funding round.

5.6.2.1 Community governance as an imitable practice
Taking a closer look at Rarible's fundraising journey, it shows that some investors did mention Rarible's community-governed approach when they talked about their investments in Rarible; however, their emphasis was always on Rarible being "the first mover" towards DAO, rarely on this new community governance model *per se*. Some investors pointed out that this governance model would not sustain a moat against other NFT marketplaces.

In CoinFund's blog article *"All digital content is going on-chain"* (2020) in which Jake Brukhman talked about the pre-seed investment decision in Rarible, besides primarily talking about CoinFund's belief in the diversification of NFT assets, at the very end of the article, he mentioned Rarible's new community governance model, *"The real innovation of Rarible is that it is on a path of gradual decentralization toward community ownership."* From this, we can tell that Rarible's implementation of a new community governance structure brought the platform an edge over other NFT marketplaces as Rarible was the first one to adopt this governance model in the NFT industry so this implementation was still an "innovation".

This "first mover advantage" was also mentioned in Elise Decamp's investment memo on Rarible (2021), published shortly after Rarible got its seed round funding. She offered some critical thoughts regarding Rarible's community governance. At that time, Rarible was still the

only marketplace that distributed platform native tokens to the platform users, representing a unique incentive proposition among all the NFT marketplaces, according to Decamp. However, she also pointed out the difficulty for Rarible to *"continue to build their moat and remain differentiated"* once other competitors introduce their own platform tokens, just as Rarible did.

It turned out that the concerns related to securing Rarible's competitive advantage regarding community governance were justified. As time goes by, more and more NFT marketplaces have decided to shift to a DAO governance structure. For instance, SuperRare kicked off a new governance model by issuing its platform native token $RARE in 2021. Although SuperRare had not issued its native token before its latest funding, in the investment memo from 1confirmation which led the seed round for SuperRare in 2020, the investment team mentioned a possible future of launching SuperRare's own token, citing Rarible as a reference. It is obvious that Rarible's pioneering efforts in this regard have influenced the whole industry. However, a DAO governance structure can be adopted by other marketplaces as well if they want. The competitive advantage of being the first community governed NFT marketplace has an expiration date.

When the time came for Rarible's A-round funding in 2021, few investors mentioned Rarible's community-governed approach, unlike in 2020 when the $RARI token was just launched. Instead, most discussions revolved around Rarible's scalability.

Some clues can also be found in the titles of Rarible's official press releases on Medium about each funding round. For the pre-seed round, the title was *"Rarible secures funding from CoinFund to build community-governed NFT marketplace"*(Rarible, 2020), placing emphasis on its community-governed trait. For the seed round, the title shifted to *"Rarible raises $1.75 million from 1kx, CoinFund, ParaFi, and Coinbase to build the next generation NFT marketplace"* (Rarible, 2021a), using the somewhat vague modifier *"next generation"*. Subsequently, in the A round with the highest funding amount, the press release used the title *"NFTs for everyone: Rarible raises $14.2 million from Venrock Capital, CoinFund, 01 Advisors to take the digital creator economy mainstream"*(Rarible, 2021b), clearly emphasizing its vision for mainstream application.

This nuanced change in the way Rarible phrases its press release titles presents Rarible's strategic emphasis at different phases and reflects the different driving factors for securing the funding. This observation, to some extent, aligns with our Proposition 1 and also indicates that a novel community governance structure does not endure as a competitive advantage that continuously captures investors' attention during fundraising.

It is apparent that decentralized community governance is a possible path to go for NFT marketplaces just as in the broader context of the blockchain industry. However, it is not always a road that is less traveled by and cannot necessarily become an inimitable competitive advantage. Hence, some investors acknowledge the trend for decentralization and appreciate a new community governance model while some investors show their hesitation towards this, explaining why Community Governance does not have any correlation with fundraising ability although it has been a pervasive topic in the Web 3.0 world.

5.6.2.2 Community governance with an untested nature

It will be beneficial for end users if the NFT marketplace adopts a DAO governance model in terms of a more democratic structure. However, due to the beginning phase of the whole industry, this new community governance model is still untested and unproven, and probably inflexible given its highly code-based nature. One critic commented on this new community governance model (Sullivan, 2022), saying *"DAOs are, I think, one of the best illustrations of the problem with a lot of these Web 3.0 projects: They are trying to find technological solutions that will somehow codify very complex social structures."*

5.6.2.3 SuperRare: Transition to a DAO

In the case of SuperRare, after closing the Series A round, the founders pushed forward a new plan to transform the platform into a DAO. However, the transition to a DAO presented certain challenges to SuperRare. For one thing, a DAO structure would alter the distribution of power significantly. In the previous model, the founding team held the authority to enforce community guidelines and oversee platform operation, the removal of undesirable participants. However, under the new community governance model, the founding team would no longer have this authority, and token holders would instead decide whether to take actions or not and how to take

actions, e.g., towards bad actors. Besides, the transition required a strategic allocation of the platform tokens to satisfy various stakeholders (Bussgang et al., 2022). Crain said, *"We need to give the community enough tokens that they will be excited about the DAO, but we do not want to give them all away. The distribution must be fair to our investors and employees."*

For another thing, a shift to a DAO also introduced new financial considerations for the founding team. First, the equity value for both founders and investors would be unclear within a DAO framework, potentially viewed negatively by investors. Second, lacking a conventional revenue stream, the platform must discover new ways to sustain the business. Third, pursuing new funding would need collective approval from the platform token holders, and the terms of the fundraising process would also necessitate collective negotiations to achieve a consensus.

In the end, SuperRare chose to adopt the new community governance model because the founders believed becoming a DAO was strategically necessary to survive in the Web 3.0 ecosystem. Since it switched to a DAO, there has not been a new investment in SuperRare. Its pre-transition decision-making process is valuable for understanding the potential challenges coming along with a new decentralized community governance structure and also provides insights about the new community governance model's impact on investors and the business.

*5.6.2.4 R*arible: Practice as a DAO

Rarible as a pioneer in implementing a DAO structure has also brought up some concerns related to its new community governance approach during the practice. One is the risk of wash trading, and the other is the risk of manipulation by token holders with significant voting power. First, wash trading on Rarible happens when a user has multiple accounts and purchases art from themselves to acquire RARI tokens which can be earned from the transactions (Hoogendoorn, 2020). Steve Walters (2023) pinpointed the consequence in his review of Rarible that the widespread occurrence of wash trading behaviors could diminish the overall value of the platform. In fact, in July 2020, the NFT economy analytics site *Nonfungible.com* delisted Rarible because extensive wash trading activities on the marketplace had distorted all statistics, posing a misleading and hazardous situation for users.

The other concern is that if a small group of token holders with significant voting power collude or coordinate their actions, they can potentially manipulate the decision-making process to serve their interests instead of the overall welfare of the community. Although it is hard to tell if this sort of manipulation ever happened to Rarible, the possibility definitely exists. For example, a proposal regarding funding the marketing working group (Rarible, 2021d) received a total of 36 votes, with 11k $RARI voting against and 3k $RARI voting in favor, ending up not being approved. Nevertheless, because one user holding 9.3k $RARI and another user holding 1.2k $RARI both voted against the proposal, this combination dominated the outcome of this proposal. Even if these two voters did not intentionally take advantage of the rule, this example shows the possibility of manipulation based on voting power, which can undermine the integrity and fairness of community governance. Part of the proposal example and the vote result can be found in Figure 13.

Overall, in Rarible's case, other than the benefits of being a DAO, challenges and risks also exist during the actual practice of Rarible, leading to concerns about the new community governance model.

Figure 13: A Rarible DAO proposal and its result
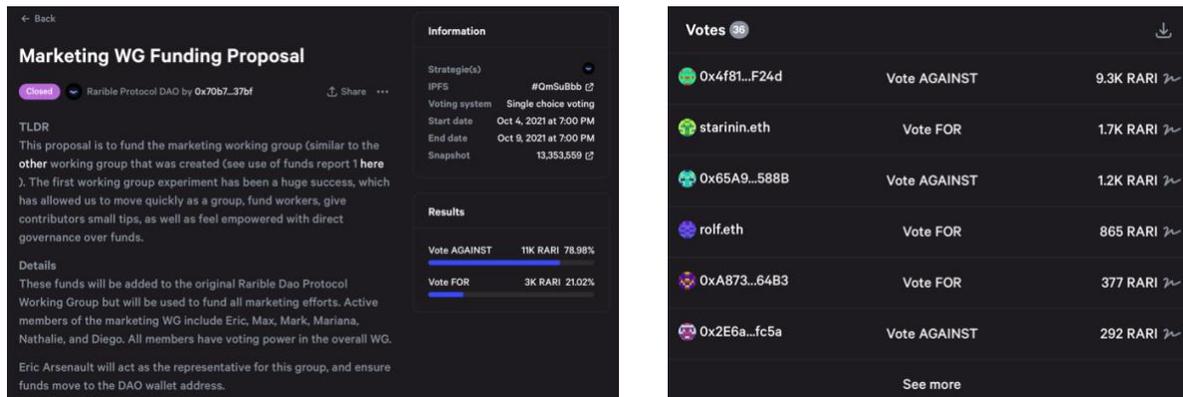
5.6.2.5 Conclusion

In conclusion, new community governance for NFT marketplaces can bring some benefits and it is considered as an inevitable trend for the Web 3.0 era in some people's opinion. However, when it comes to fundraising, a new community governance structure cannot establish a moat for the platform to sustain a competitive advantage over competitors. Moreover, its untested nature

comes along with challenges and concerns that can make risk-averse investors hesitant about their investment decisions. Hence, community governance does not correlate with NFT marketplaces' fundraising ability given that the ongoing experiments with a new governance model have not reached a clear conclusion.

5.7 Findings

Study 2 explored the underlying mechanisms of Study 1 results, explaining reasons for the existence of certain correlations and for the absence of correlation between community governance and the platform fundraising ability. Specifically, investors consider the growth potential of NFT marketplaces to make investment decisions. The growth potential is greatly influenced by the transaction structure and the community engagement which are largely shaped by the visions of the platforms. As for community governance, adopting a new community governance model for NFT marketplaces can be a unique proposition for early adopters. However, a new governance model cannot necessarily become a sustainable competitive advantage to attract investors and its unproven market performance also results in some concerns that may influence investment decisions.

6. Conclusion

The goal of this thesis is to shed light on how NFT marketplace design influences the fundraising ability of the platform and why. Based on a regression analysis, we identified two platform design factors that have correlations with fundraising ability, Transaction Structure and Community Engagement. Surprisingly, despite the extensive discussions revolving around Community Governance in the Web 3.0 ecosystem, Community Governance did not turn out to be a significant factor for NFT marketplaces' fundraising ability, irrespective of the chosen Community Governance model.

A multiple case study further explored the mechanisms underlying the existence and absence of the correlation. Notably, Transaction Structure and Community Engagement are shaped by different visions of the NFT marketplaces and investors evaluate the growth potential related to the platform vision to make investment decisions in a nascent industry, explaining the observed

correlations between these two factors and the fundraising ability. As for the Community Governance of NFT marketplaces, there are still ongoing experiments with the new Community Governance model. The novelty may create a competitive advantage for early adopters, yet this new governance model is not inimitable as a moat for the platform. Meanwhile, the new decentralized governance structure has remained unproven so far due to the infancy status of the whole industry, and it comes with both benefits and risks. This dynamic results in different investor attitudes towards the decentralized community governance, explaining the absence of correlation with the platform's fundraising ability.

Figure 14: Conclusion
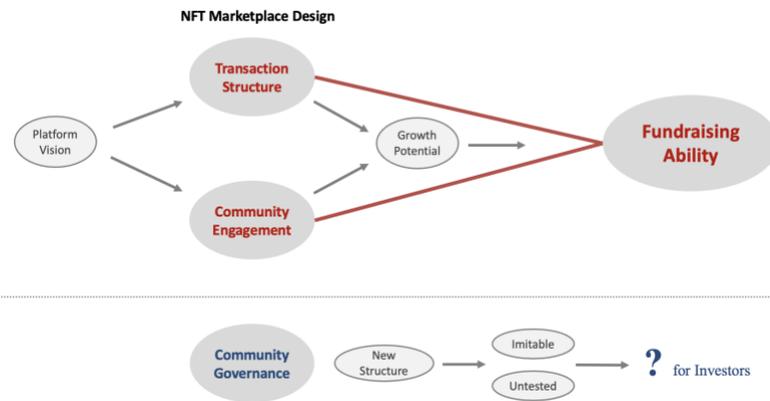
7. Discussion

7.1 Theoretical Contributions

From a theoretical perspective, this research contributed a theoretical framework clarifying the correlation between NFT marketplace design and NFT marketplace's fundraising ability, including the underlying mechanisms. This theoretical framework enriches the extant research mostly revolving around the technical aspects of NFT and blockchain (Risius and Spohrer, 2017) and provides insights into the ongoing research about NFT ecosystem (Wilson et al., 2022) by exploring the dynamics between two stakeholders, NFT marketplace and investors (Wilson et al., 2022; Wilkoff and Yildiz, 2023).

As digital platforms are built on digital infrastructures, the emergence of blockchain technology has brought the possibilities of platforms leveraging blockchain as an infrastructure

(Constantinides et al., 2018), allowing trusted transactions on digital marketplaces without the need for central coordination. Hence, this research also contributes to the research regarding blockchain-based digital platforms with a focus on the platform design. Particularly, this research discussed the decentralized platform governance structure in NFT marketplaces, providing critical thoughts on the outcomes that a decentralized governance model can bring.

Furthermore, by diving deep into the investment rationale of venture capitalists for NFT marketplaces, this research exemplified venture capital investment in an emerging industry, continuing to explore the determinants for venture capitalists to make investment decisions and echoing the previous findings that venture capital evaluates growth projection, invests in visions, and relies on narratives (Fabozzi, 2016; Birch, 2022; Klonowski et al., 2018; Muniesa et al., 2017).

Moreover, our findings contribute to the broader discourse on investment in young firms, particularly in sectors driven by new technologies like blockchain. By dissecting the investment rationale of venture capitalists in the context of NFT marketplaces, this research provides a nuanced understanding of the factors that venture capitalists consider when investing in emerging industries. These factors include not only the potential for growth and visionary leadership, as previously identified in the literature, but also the innovative use of technology and governance models in platform design. Such insights are invaluable for entrepreneurs and policymakers looking to attract investment in young industries, offering a roadmap for what makes firms in these sectors appealing to investors. In doing so, this research bridges the gap between the specific case of NFT marketplaces and the general principles governing investor attraction in emerging markets, enriching both the academic discourse and practical applications in the field of investment and entrepreneurship.

7.2 Managerial Implications

First, this research outlined the common approaches of NFT marketplace design at this development stage of the NFT industry. This comprehensive overview of the present landscape serves a dual purpose: aiding existing players in refining their roadmaps regarding future feature upgrades and facilitating the platform design for potential NFT marketplace entrants.

Particularly, for those NFT marketplaces that have fundraising on the agenda, the identified relationships between NFT marketplace design and the platform's fundraising ability provide valuable insights. These insights extend to the strategic considerations of marketplace design, future development, and approaches to pitching to investors, providing a deep understanding of how to attract capital effectively.

Specifically, NFT marketplaces should understand the investors' emphasis on the platform's growth potential. It is crucial to present the proven growth rate in the past or envision the huge growth potential in the future to investors during fundraising. A broad market is associated with substantial growth while a niche market is especially helpful for developing an engaged community group which is also a factor influencing investors' decisions. However, in general, a vision for a broad market with a large community can bring a bigger funding amount than a positioning at a niche market with a dedicated community and can probably make the fundraising process easier.

Moreover, the research presented potential risks and challenges related to the decentralized governance structure, facilitating the decision-making process concerning whether the NFT marketplace should adopt a new governance approach or not. NFT marketplace founders should thoroughly consider both the benefits and challenges that come along with the new governance model. This consideration is crucial in a context where ongoing discussions about the decentralized governance model primarily emphasize democratization and empowerment for individual users, often overlooking potential challenges from the platform's perspective.

For those NFT marketplaces that have already adopted a decentralized community governance structure, this research can serve as a reminder for continuous efforts to improve the overall platform efficiency and mitigate the possible risks associated with the decentralized governance, e.g., wash trading and manipulation of the voting power.

7.3 Limitations of the Study

As with exploratory work in general, it is imperative to acknowledge that our findings cannot be asserted as exhaustive or universally representative of the entire landscape of NFT marketplaces.

During the research design, we selected NFT marketplaces allowing NFT art transactions as the empirical setting. There might be alternative findings in other settings or a broader setting.

Simultaneously, given that the NFT industry is still in its nascent stages and the market has exhibited considerable volatility, our findings may have temporal sensitivity. This underscores the necessity for future research endeavors to explore the evolving dynamics within this emerging field.

There are limitations for the two sub-studies respectively as well. For the regression analysis Study 1, only 34 observations were available due to the nascent nature of the NFT industry and the specific requirements of our research focus. As for the data collection of Study 1, we only collected the disclosed amount of the dependent variable Funding due to the data accessibility, but there might be alternative study results with the undisclosed amount taken into account. Moreover, we did not include control variables in our regression model. Due to little previous research regarding our research topic, it was hard to identify control variables during our research design stage because we were unsure about which variables would introduce noise for the analysis.

For the multiple case Study 2, while the methodology of the case study is valuable for in-depth exploration, it comes with some inherent drawbacks. For one thing, given the specificity, the case study methodology might not be the best for generalizing findings. However, we carefully chose the representative focal cases to mitigate this limitation. For another thing, the case study methodology heavily relies on the researcher's interpretation. This subjectivity can introduce bias into our results.

Additionally, in our case study, we collected data mainly from accessible archival data due to the time limit. Although both focal cases are young start-ups with a lot of transparency and we managed to track them from the beginning to limit left-censoring, the archival data from the investor's perspective was not as accessible and abundant as the two sample NFT marketplaces'. Ideally, it would be better to add more data sources, e.g., in-depth interviews with both marketplace founders and investors and surveys for community members.

7.4 Future Research

The emergence of blockchain technology opens up a lot of possibilities for the future, calling for future research. As mentioned before, most extant research regarding blockchain and NFT revolves around the technical aspects (Risius & Spohrer, 2017). Hence, future research can bring more managerial perspectives into this nascent field. An exploration of managerial considerations within this nascent domain would strengthen our understanding of the broader implications and applications of blockchain technology and NFTs beyond their technical facets.

Meanwhile, extant research about digital platforms mostly centers on digital platforms in Web 2.0. In the future, there is a need for a more comprehensive exploration of the potential of blockchain-based digital platforms. This also entails an examination of the applicability of theories originally formulated for Web 2.0 digital platforms within the distinctive context of Web 3.0. Such research endeavors would contribute to a more thorough understanding of the evolving digital landscape and facilitate the development of tailored theoretical frameworks for the emerging paradigm of Web 3.0 digital platforms.

Besides, more research about community governance within the Web 3.0 ecosystem is necessary to pinpoint potential enhancements based on ongoing experiments with the decentralized governance structure and to assess its viability as a predominant platform governance model in the future. When there are both advantages and drawbacks associated with a decentralized governance structure, future research can focus on how to maximize the efficiency of platform governance in Web 3.0 with the trend of decentralization. This calls for strategies to capitalize on the benefits while mitigating the challenges posed by decentralized governance, thereby contributing to the refinement and sustainable evolution of governance models within the Web 3.0 ecosystem.

Furthermore, throughout the course of our research, we discovered instances where several NFT marketplaces ceased operations despite having previously secured funding. Given the conspicuous volatility within this nascent market, conducting dedicated research with a specific emphasis on the survival analysis of NFT marketplaces holds the potential to yield valuable

insights into the intricate dynamics of the NFT industry. Such an investigation would contribute to an understanding of the factors influencing the sustainability and longevity of NFT marketplaces, shedding light on the challenges and considerations crucial for their continued viability.

8. References

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9. Appendix

Appendix 1: Sample Marketplaces for Study 1

AlienSwap, Anotherblock, Art Blocks, Async Art, Blur, Dank Bank, Ensemble, Fair.xyz, Few and Far, Flowty, Foundation, Fxhash, HoDooi.com, Joepegs, KnownOrigin, LiveArtX, Magic Eden, MakersPlace, MetaMundo, Mintable, Mintbase, Mintverse, Oncyber, OpenSea, PancakeSwap, Rarible, Sloika, Sticky, SudoSwap, SuperRare, Talis Art, TRLab, UpYo, Verse

Appendix 2: Results of Factor Loadings for Study 1

Loadings:

	Factor1	Factor2	Factor3
Spec	-0.65	-0.32	
Vetting	-0.71		
Aggregator	0.69		0.37
Launchpad	0.73		
Blockchain	0.81	-0.32	
DAO		0.94	
Token		0.8	
Proposal		0.83	
Events			0.78
Discord			0.77
KS			
Roadmap			0.31
Drop			
Affiliate	0.41		
Primary			
Secondary			
Royalty			
Auction			
FiatC			0.33
InformD		-0.41	0.43
Wallet	0.31		0.47

	Factor1	Factor2	Factor3
SS loadings	3.22	2.84	2.58
Proportion Var	0.15	0.14	0.12

Cumulative Var	0.15	0.29	0.41

Factor Correlations:

	Factor1	Factor2	Factor3
Factor1	1	-0.29	-0.1
Factor2	-0.29	1	0.11
Factor3	-0.1	0.11	1

Notes:

Test of the hypothesis that 3 factors are sufficient.

The chi square statistic is 157.19 on 150 degrees of freedom.

The p-value is 0.327

Appendix 3: Results of Factor Scores for Study 1

Marketplace	**Factor1**	**Factor2**	**Factor3**
AlienSwap	1.76862967	-0.8152366	0.85516181
Anotherblock	-1.2176012	-0.6548519	-0.1594125
Art Blocks	-1.1740471	-1.0572765	1.11350784
Async Art	-0.1110037	-0.2509843	-0.618098
Blur	0.65218396	1.78478142	-0.9616417
Dank Bank	-1.1984658	-0.6424835	-0.6105515
Ensemble	-1.3133197	-0.9748446	-1.1164025
Fair.xyz	0.64338787	-0.6619701	-0.390542
Few and Far	-0.2659962	-0.113836	-0.5520793
Flowty	0.27935186	0.1087133	-1.8715068
Foundation	0.47838439	-0.5608495	-1.5843639
fxhash	-0.2070853	-1.0578099	0.60261115
HoDooi.com	2.1022118	-0.7495413	0.35878208
Joepegs	1.1292191	-0.0499799	-0.0414966
KnownOrigin	-0.292695	1.00465483	0.12877579
LiveArtX	-1.2735941	0.93414862	1.55804734
Magic Eden	0.76357054	1.2392549	1.25449858
MakersPlace	-1.276857	-1.1446298	1.03928375
MetaMundo	-1.3451501	-1.190105	0.77091636
Mintable	1.28998676	1.54201896	0.17831882
Mintbase	0.61554367	1.53559782	-0.1553561
Mintverse	0.3855546	0.87589204	0.70485484
Oncyber	0.19327881	-1.1855934	0.5731529

OpenSea	2.11781057	-0.9478835	1.49742457
PancakeSwap	-0.1477543	1.49689885	0.53912273
Rarible	1.09212006	1.28583941	1.08659198
Sloika	-1.3065793	-1.1372924	0.65408554
Sticky	0.38753992	0.06846279	-1.8503231
SudoSwap	0.04352652	1.7739244	-1.5174586
Superrare	-1.4197626	0.82009597	1.34126309
Talis Art	0.52828105	1.17694162	-1.4732456
TRLab	-1.2078396	-1.0631452	0.62848527
UpYo	0.5119078	-0.3209541	-2.4081222
Verse	-1.2247379	-1.0679576	0.42571612