



# Purchase Behavior of NFTs – Analysis of Drivers and Barriers in Germany

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## **Abstract**

Non-fungible tokens (NFT) have enjoyed rapid market growth within the last year. Based on a blockchain, the new technology brings the ability to serve as a certificate of authenticity. NFTs are uniquely verifiable and can be traced back to the owner. They can embody digital and real assets and assign them a unique value. Due to their traceability, NFTs have great potential in diverse application areas. This work aims to identify the associated drivers and barriers and analyze the buying behavior in Germany for NFTs. In this context, the study examines three different groups to capture the different aspects: NFT owners, people who do not own NFTs but are interested in buying them, and people who are not interested in buying them, but have a fundamental knowledge about the unique tokens. Qualitative and quantitative data collection is chosen to analyze the drivers and barriers. The theoretical part of the thesis focuses on the worldwide NFT-market and tries to draw first conclusions for the German market. Thereby first motives and obstacles for the purchase of NFTs are shown. Further data are found through an expert interview as well as ten in-depth interviews. In addition, 98 people in Germany were asked about their preferences and dislikes in a survey. The present work identified significant differences and similarities among respondents regarding drivers and barriers to NFT purchasing behavior.

Keywords: NFT; Ethereum; Bitcoin; Web 3.0; Token; Decentralization; purchase behavior; survey

## Resumo

As fichas não fungíveis (Eng.: Non-Fungible Token – NFT) registaram um rápido crescimento no mercado no último ano. Com base numa cadeia de bloqueio, a nova tecnologia desenvolve a capacidade de servir como certificado de autenticidade. As NFT são verificáveis de forma única e podem ser rastreadas até ao proprietário. Podem incorporar bens digitais e reais e atribuir-lhes um valor único. Devido à sua rastreabilidade, as NFTs têm um grande potencial em diversas áreas de aplicação. O objectivo deste trabalho é identificar os condutores e barreiras associados, e analisar a evolução da compra de NFT na Alemanha. Neste contexto, são examinados três grupos distintos: proprietários de NFT, indivíduos que não possuem NFT mas que têm interesse em comprá-las, e pessoas que não estão interessadas em comprá-las, com o objetivo de captar as diferentes perspectivas. Para analisar os condutores e as barreiras, foi seleccionada a recolha de dados qualitativos e quantitativos. A base teórica da tese centra-se no mercado mundial de NFT, a partir do qual se tentam extrair as primeiras conclusões para o mercado alemão. Assim, são apresentados os primeiros motivos e obstáculos para a aquisição de NFT. Outros dados foram obtidos através da realização de 10 entrevistas. Adicionalmente, foram inquiridas 98 pessoas na Alemanha relativamente às suas preferências e antipatias. O presente trabalho permitiu identificar diferenças e semelhanças significativas entre os inquiridos em termos de motivações e obstáculos quanto ao comportamento de compra de NFT.

Palavras-chave: NFT; Ethereum; Bitcoin; Web 3.0; Token; Descentralização; comportamento de compra; inquérito

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# 1 Introduction

Mike Winkelmann, also known as the artist Beeple, sold a digital artwork at Christie's for \$69.3 million in 2021 (Nicky Eaton et al., 2021). The digital asset was offered for sale as a so-called NFT - a non-fungible token. The Token reached the most expensive price ever paid for an NFT, making Beeple's artwork "*the third-highest auction price achieved for a living artist*" globally (Scott Reyburn, 2021).

The increasing attention generated by NFTs is epitomized by blockchain technology (Wang et al., 2021). NFT projects in the art segment, in general, saw a 12,000 percent increase in sales from December 2020 to December 2021. By the end of 2021, the Ethereum blockchain-based transaction volume in the digital art market alone has surpassed \$2.1 billion (Statista, 2022).

But why are NFTs being sold for millions of dollars? NFTs are unique digital assets that can represent real or digital objects. They are non-exchangeable and can be used as a striking proof of ownership, making them counterfeit-proof (Wang et al., 2021). Therefore, it is not possible to duplicate standard digital files and claim them as property, since the owner is directly associated with the asset. These properties are based on smart contracts and are saved on the Ethereum blockchain (Wang et al., 2021). This new technology has recently given rise to various platforms that offer the possibility of buying, selling, and trading NFTs. The digital artworks can be minted on the artist's websites and traded on secondary marketplaces via smart contracts.

Despite the not least enormous development of the NFT transaction volume, the level of awareness, use cases, and general acceptance is still in its early stages. It is not yet widely accepted that NFTs are used as a digital medium and, consequently, successfully deployed in organizations (Arun Sundararajan, 2022). Despite its rapid development, understanding NFT-related content in commerce is fraught with widespread skepticism. This thesis investigates drivers and barriers to discover key aspects and to gain a deeper understanding of buying motivation.

## 1.1 Research Proposal

This thesis investigates the purchasing behavior of NFTs in Germany. It evaluates the comprehensive growth of the NFT industry by identifying the present issues of the demand-driven buyer side and the associated purchase intent criteria. The NFT industry is globally

spread, to capture a unified overview of desired variables, it is focused on the German market. Not least because leading German companies like Porsche AG and Adidas AG have sold their own NFTs on the market (Nadescha Vornehm, 2021) (adidas AG, 2022). It is expected that digital art based on NFTs would achieve widespread appeal in the next years due to the sharp rise in transaction volumes over the past year. Especially from the motivation of already existing buyers, possible drivers are derived to show future potential.

## **1.2 Research Question**

Future business opportunities characterized by decentralized markets as well as information exchange can be realized through NFTs. Nevertheless, besides the enormous potential, the technology is still at an early stage. Barriers need to be overcome and potentials highlighted to underpin the possibilities of NFTs. The following research topics are developed from the problem statement of this thesis:

**RQ1: What are the drivers to purchase NFTs in Germany?**

**RQ2: What are the barriers that prevent the purchase of NFTs in Germany?**

Since adaptation in the NFT market in Germany currently only accounts for a small share, the drivers and barriers between NFT buyers and non-buyers are also differentiated. The non-buyers are in turn divided into two classes. On the one hand, those who are interested in buying NFTs and, on the other hand, those who are not interested in buying but have basic knowledge about NFTs. Based on the differentiation of the three groups, a third research question is derived:

**RQ3: What are the differences in purchasing behavior between people who already own at least one NFT, those who are interested in purchasing an NFT, and those who are not interested in purchasing but have knowledge about NFTs?**

## 2 Literature Review

### 2.1 Definition and Technology

Many successful artists were only credited with groundbreaking success after their death. Van Gogh and Picasso shaped the art market and its accompanying epochs through extravagance, stylistic breakthroughs and unique aesthetics. But extraordinary and outstanding paintings were not always a guarantee of pronounced interest (Jan Dalley, 2021). In this age of constant change and advancement, the acceptance of new art is more quickly rewarded. Through crypto-art and NFTs, it is clear that being different has found favor in the art market and has become competitive. The new way of defining art in the digital age is characterized by clear identification and authorship, as well as monetary attribution and value (Jan Dalley, 2021).

*H1: Purchase is driven by the artwork*

Clear identification and decentralization are characterized by blockchain technology. A blockchain is a continuous list of records in individual blocks, initially developed by Nakamoto (Satoshi Nakamoto, 2019). The original concept of blockchain history dates back to 2008. Bitcoin is the first-ever cryptocurrency and is considered a pioneer (The Economist, 2015). Using cryptographic techniques, new blocks can be created and linked to the existing chain (Nathan Popper, 2016). In this process, blockchain is based on the proof-of-work algorithm, which enables the provenance of data to be traced in a decentralized network, also known as distributed ledger technology, thereby uncovering information gaps (Arthur Gervais, 2016) (Lamport, Shostak, Pease, 2019). The blockchain is characterized by a timestamp and transaction data (The Economist, 2015). As soon as information changes are perceived on the blockchain, it renders previously-stored data unusable (Gervais, 2016).

*H2: The technology has a positive impact on buying behavior.*

Each user has a unique blockchain address that may be used to transfer and receive assets. The blockchain address contains numbers and alphanumeric characters and is akin to a traditional bank account. The prerequisite for setting up a blockchain address is a public and a private key. The public key typically consists of ten to twelve random phrases, whereas the private key is put up by the address owner to ensure that no institution has access to it. To transmit an NFT, the owner must log in to the address with the private key, enter the receiving blockchain address and confirm it with a digital signature (The Economist, 2015).

*H3: The entry barrier is too complex and thus has a negative effect on potential buyers.*

In late 2013, Ethereum, the first cryptocurrency to allow programming and executing software on the blockchain, entered the crypto world. It was the first open-source cryptocurrency to enable and share customizations on a global infrastructure through so-called smart contracts (Tapscott & Tapscott, 2016). A smart contract, developed by Szabo, is a tool that automatically executes, controls and documents transactions under given parameters and approvals. This means that the smart contract executes exactly what is specified in the program. Through the interplay of decentralized manner on the blockchain, smart contracts enable them to perform a direct exchange of data without the intervention of third parties, which leads to a considerable acceleration in time (Szabo, 1996). In the Decentralized finance industry (DeFi), Ethereum makes up most of the total value. Total value locked (TVL) is the closest measure to a total market size in the DeFi industry. As of March 2022, out of 100 blockchains, Ethereum has a market share of over 50% and is therefore the most adopted blockchain in the DeFi industry (Raynor de Best, 2022).

Initially, the cryptocurrency was based on Ethereum Improvement Proposals (EIP)-721 and most recently evolved into EIP-1155 (Chainalysis, 2022) (Radomski, Cooke, Castonguay, Therien, Binet, Sandford, 2018). What makes the cryptocurrency Ethereum unique are the inherent characteristics that distinguish it from traditional currencies like Bitcoin. Compared to Ethereum, Bitcoin is a currency in which all generated tokens have the same value and are therefore exchangeable (Satoshi Nakamoto, 2019). On the other hand, tokens based on the Ethereum blockchain are unique and cannot be exchanged or counterfeited.. This makes it possible to generate a unique allocation through these tokens and not replicate them (Gavin Wood, 2014). Based on the Ethereum Blockchain, smart contracts are used to determine the holder and thus prove an allocation to the NFT. With the allocation of the NFT, transactions can be made to other users on the identical blockchain through the smart contracts (Gavin Wood, 2014). The history and relevant parameters can be traced through the blockchain and thus a gap-free value can be proven (Satoshi Nakamoto, 2019).

## **2.2 NFT Use Cases**

NFTs have many applications and can relate to almost any digital or real asset that embodies value. For example, they contribute expressions in the form of videos, virtual real estate, domain names, or digital images (Robyn Conti, John Schmidt, 2022). Digital art can attract more attention because the channels of conventional art require more effort. Moreover, through

digital art as NFT, the attention achieved can be measured, reflecting a potential demand and increasing the price (Chainalysis, 2022). NFT technology makes transactions easy by decentralizing the data and the associated stored identity.

Another advantage of digitizing artworks through NFT technology is that the programming can consider royalty distributions from future sales. Thus, fees or percentage ratios can flow back to the artist (Wang et al., 2021).

### Pioneers in the NFT industry

NFTs bring forth many possibilities that appeal to a wide variety of fields. Interest in NFT-based games or NFT collections is just one possible application. One of the first and most successful examples is the collection "Cryptopunks", based on ERC-721 and defined by 10,000 unique and collectible "punks" (Opensea.io, 2022). The transaction volume was around 875.9ETH (2,849,995.92\$) in March 2022 (Opensea.io, 2022).

One of the first NFT games based on the blockchain is "Cryptokitties". To successfully participate in the game, these so-called "kitties" are necessary, which were auctioned in the aftermarket for over 1145ETH (3.725.165,90\$) (Robert Hoogendorn, 2022). Another project with a considerable share in the NFT market is a trading platform launched by the NBA – "NBA Top Shot". The platform sells digital short videos of NBA moments, which visualize the scoring of NBA players (Roham Gharegozlou, 2018). At the beginning of November 2021, the trading volume on the platform was over \$885m (DappRadar.com, 2022). It is important to note that the NFT short videos could be purchased on the platform created by NBA with a credit card, which makes the entry barrier appear very low and thus quickly generated great acceptance (Weston Blasi, 2021).

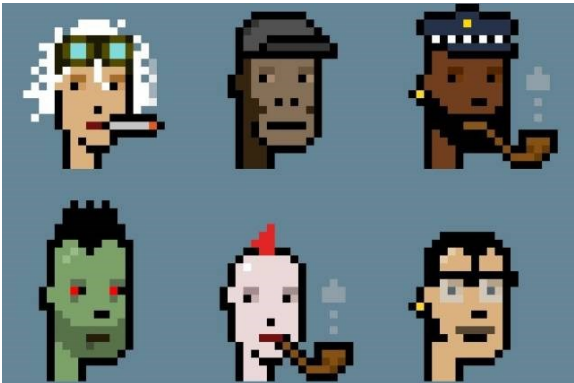


Figure 1: NFT Example Cryptopunks



Figure 2: NFT Example NBA Top Shot

### 2.3 Market analysis

The NFT industry is still in its early stages, yet it has experienced a considerable boom in the recent past. The following section will answer the question of the exact scope in terms of transaction volume, the target group of buyers and their intention to buy NFTs as well as analyze the growth trend in the last few months.

The global NFT market has grown 20,873% across all industries from December 2020 to December 2021 (NonFungible, 2022). This includes areas such as gaming, sports as well as the arts and other segments that can benefit from a unique digital image. Only NFT sales between buyer and seller are included, which are reflected in the sales volume. Transactions within an NFT are not included in the sales volume. For example, in-game transactions within an NFT game are not recorded. For the Collectibles segment, NFTs had a value of over \$16m in 2020, while in the Art segment, NFTs had a turnover of over \$17m. In the following year at the same time 2021, both segments reached a volume of \$9,200m (NonFungible, 2022). Collectibles and art are particularly important for the segments to be examined in the thesis. Collectibles are digital records that can represent both a physical and immaterial object and thus can also tokenize artworks. In order to show growth trends in the NFT market, the trading volume in USD is used to provide a transparent and comprehensible overview of past periods. The trading volume, in this case measures the total amount of Ethereum-based transactions on Opensea.

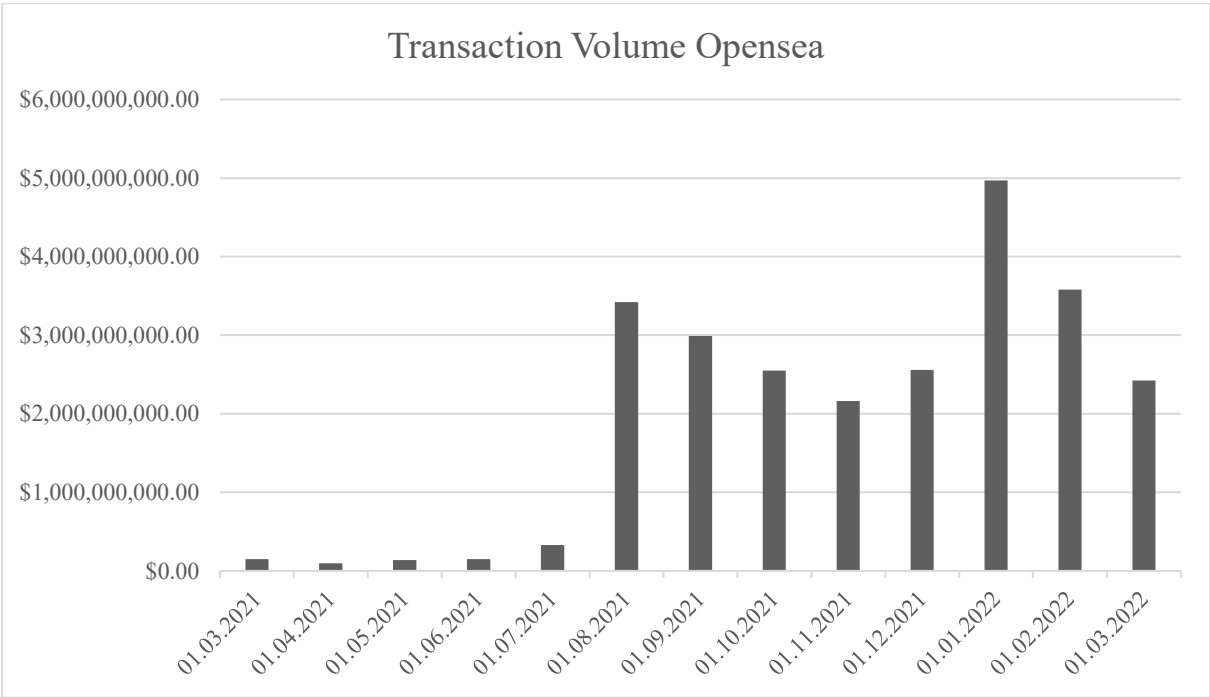


Figure 3: Transaction volume Opensea (Richard Chen, 2022)

Figure 3 shows the monthly volume traded from 01.03.2021 to 01.03.2022. The level of the value is reflected in the converted volume. A rising volume visualizes increased interest in the NFT market. Decreasing values indicate a reducing activity in the market, which is represented by a possibly decreasing interest. As shown in figure 3, the transaction volume increased significantly between July and August. In August 2021, the volume broke the 1-billion-dollar barrier for the first time and directly reached a 3.4-billion-dollar volume (Richard Chen, 2022). The rapid increase is linked to the NFT game Axie Infinity, which has generated huge popularity in Southeast Asia (Business Insider India, 2022). The chart illustrates that the transaction volume was highest in January 2022, at \$4,68bn.

In order to create, buy or sell NFTs, users need a so-called *wallet* that supports blockchain transactions. In October 2021, the actively used number of wallets peaked at 571,043 users (NonFungible, 2022).

In terms of demographic age groups, US Data in March 2021 shows that around 22% of the population in the 18-34 and 35-44 generations have invested in NFTs. However, the US average was only 12% invested in NFTs as of March 2021 (Andrew Laningham, 2022). The following thesis examines the detailed demographic characteristics of the German population. The primary motivation for US citizens was the return on investment, which averaged 40% across all age groups. There is a clear trend that as age increases, the importance of return on investment increases steadily among US respondents who have purchased NFTs as well. In the 35 to 44 age group, only 25% of men mentioned return on investment as a reason for buying NFTs. By contrast, about twice as many respondents in the 55 to 65 age group indicated a return on investment as the driving motivation for an NFT purchase. At around 58%, men aged 35-44 said the main reason behind buying NFTs was being "fans" of the art (Andrew Laningham, 2022). This can be traced back to the pioneer collections of "Bored Ape Yacht Club" and "Cryptopunks" at this time (Rick Delaney, 2021). Other purchase intentions recorded with an average of 30% across all age groups are influenced by family and friends and related to the trend. Around 28% of all respondents in the US indicated themselves as early adopters as a motivation for NFT purchase. Only 17% claimed purchase intention due to the unique entitlement rights behind an NFT (Andrew Laningham, 2022).

### **3 Methodology and Data Collection**

In order to substantiate the research questions and to gain initial findings on the hypotheses from the theoretical part of the thesis, further research instruments are applied. The research approach known as mixed methods is utilized in order to collect all of the essential data in the most efficient manner feasible. The methods of data collection and analysis utilized in this dissertation are both quantitative and qualitative in nature (Mark NK Saunders et al., 2019). The two-way approach to the research methodology encourages the comprehensive answering of the research questions and is an appropriate technique to analyze the data in this thesis. In the first phase of data collection and analysis, this thesis focuses on the qualitative methods so that the second phase, the quantitative approach, can expand and deepen the first findings (Mark NK Saunders et al., 2019). This aims to explain different variables (Mark NK Saunders et al., 2019). The motivations for purchase or non-purchase, are evaluated and analyzed based on the data collected.

#### **3.1 Expert Interview**

The first phase of the mixed-methods approach is the qualitative investigation. In order to gain a deeper insight into future development, an expert interview was performed to obtain more detailed information. The expert interview is conducted with a Web 3.0 specialist to get a better perspective on the future of NFTs. The interview partner is Arne Kronemeyer, the founder of the Web 3.0 company “Sastro Software”, who has a broad knowledge of the decentralized web and NFTs. Thus, Kronemeyer has extensive experience in Web 3.0 software development. The interview lasted around 30 minutes, it was conducted via Zoom and was also recorded with the participant's permission.

#### **3.2 In-depth Interviews**

Additional qualitative data will be collected through in-depth interviews that build on the expert interview. In this phase, interviews are done based on a specific framework that analyzes the research topics and expands on the original findings. Non-standard, semi-structured, and predominantly open-ended questions are used to acquire qualitative data.

In-depth interviews are individual interviews in which interviewees are asked about a specific issue and thus defined as a qualitative research technique (Carolyn Boyce & Palena Neale,

2006). This allows detailed perspectives of the interviewee to be collected and new insights to be gained (Carolyn Boyce & Palena Neale, 2006). Predefined questions structure the interview, but detached follow-up questions to clarify and understand the interviewee's opinion are permissible at any time. This attempts to understand and broadly cover the deeper statements (Mark NK Saunders et al., 2019). By asking specific questions, however, it is possible to weigh the focus of the interview flexibly.

The in-depth interviews were conducted in the form of one-to-one conversations via Zoom and lasted an average of 15 minutes. The interviews were recorded with the consent of the interviewee. A total of 10 interviews were conducted. On the one hand, five persons were interviewed who already own at least one NFT, and on the other hand, five persons who do not own an NFT but already have a deeper understanding of NFTs. This captured different motives and perspectives about the drivers and barriers in this regard. The choice of respondents was based on different ages, genders, and professions to represent socio-demographic factors.

### **3.3 Online Survey**

The third phase of the mixed-methods approach, is the quantitative research. In this case, consumer behavior is analyzed with the help of a survey. The survey consists of standardized questions designed to methodically gather information and motivations from individuals (Bhattacharjee, 2012). An internet questionnaire sent to a representative sample can be used to uncover differences between NFT holders and non-NFT holders. Based on the data collected, static models can be added that reveal relationships between drivers and barriers.

#### **3.3.1 Sampling Technique**

The quantitative survey is defined by the non-probability sampling used by voluntary samples and was also chosen due to cost and time efficiency (Mark NK Saunders et al., 2019). However, non-response bias can occur and lead to bias, which would have a negative impact on representativeness. The participants in the questionnaire can decide for themselves whether they want to take part in the survey. With the help of the survey software Qualtrics.com, the cost and time efficiency is counteracted and the extensive data entry is circumvented (Mark NK Saunders et al., 2019).

Since the NFT market in Germany is analyzed in this thesis, the questionnaire is written in German for comprehensibility for the participants. Furthermore, care is taken to distribute the link to the questionnaire exclusively in German-speaking forums. The forums are primarily on Facebook and Discord. Facebook was chosen because of its "group" function. In this way, it is possible to limit exactly which people have access to the questionnaire. Discord was selected because it is primarily used for exchanging information about new projects regarding NFTs and as the leading communication platform in the NFT market (Tal Navarro, 2022). The focus here is also on German-speaking channels. The targeted dissemination of the questionnaire attempts to reach the potential target group of NFT owners and non-NFT owners and thus gain concrete insights from the participants.

**3.3.2 Sample Size**

To accurately derive conclusions from the quantitative data collected, the number of responses is critical (Mark NK Saunders et al., 2019). It is defined as the sample size and calculated based on the population size, the margin of error and the confidence level (Mark NK Saunders et al., 2019).

The following formula represents the sample size:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

*Figure 4: Sample Size Formula*

- N = population size
- e = margin of error
- z = z-score

The population is defined by the total number of people to be studied. The margin of error rate indicates the accuracy of the survey results, the lower the rate, the more accurate the response. It is important to note that the margin of error must be within acceptable limits (Mark NK Saunders et al., 2019).

With the help of the formula, a minimum sample can be calculated. In the case of the NFT market, the following parameters are considered:

- Population of Germany: 83,160,871 (World Bank, 2022).
- Percentage of population in Germany that has knowledge of NFTs: 5% (Davor Kolaric, 2022)
- Confidence level: 95%
- Margin of error: 5%

Thus, according to the formula, a minimum sample of 73 participants results.

### **3.3.3 Measurement Scale**

In order to draw clear insights from the survey, a precise design of the rating options is essential (Mark NK Saunders et al., 2019). Discrete rating scales are used in the questionnaire to provide elaborate possibilities as well as not overburden the respondent's decision (Axel Franzen, 2014) (Konrad Wolfgang Kallus, 2016). By choosing the Likert scale, respondents can make positive as well as negative constructed statements. The scale goes from 1 (strongly disagree) to 5 (strongly agree), with the possibility to indicate a neutral answer, number "3" (neither agree or disagree) (Konrad Wolfgang Kallus, 2016).

### **3.3.4 Questionnaire Design**

The first question in the survey was whether the respondent had German citizenship. The survey was closed if the question was answered "No". The following question was whether the respondent had knowledge about NFTs. If the answer was negative, the questionnaire was also closed. The next question asked whether the respondent was in possession of an NFT. In this way, the respondents could be divided into a consumer and a non-consumer group, and based on these, drivers and barriers could be explored. Twelve questions were asked, inquiring about the respondent's agreement or disagreement. In the last part of the survey, socio-demographic data of the respondents were also collected.

### **3.3.5 Research Ethics**

To ensure that the ethnic framework was adhered to when collecting data through the questionnaire, the respondent was given detailed information on the first page of the questionnaire. The respondent was informed about the method of data analysis, anonymity, and the respondent's rights. The researcher provided contact details for any questions that might arise about the respondent's ethnicity. (Mark NK Saunders et al., 2019). The ethnic clarification on the first page is shown in the appendix.

## 4 Analysis

### 4.1 Expert Interview

The expert interview starts with the identification of motivations for the interest of NFTs. The first and second questions determined whether the expert has already bought NFTs, and if so, when his first purchase was. The motivations for buying NFTs were then identified. Mr. Kronemeyer has already been involved with the topic of crypto and Web 3.0 since 2017. Due to the enormous increase in trading volume in the digital art market in the second half of 2021, his attention was drawn more to the topic of NFTs. He wanted to understand the motivations behind the hype, which led him to his first purchase. In the context of the thesis, the primary purpose of the expert interview is to acquire insight into future development.

Kronemeyer detaches himself from the art market and mentions other possible application areas. He believes that the initial thought behind the creation of an NFT is the utility and that it is associated, for example, with royalties that can be paid out to the buyers over a longer period of time.

*“Based on the new technology, this is a revolution as the artists or developers of the NFT can profit from the resale forever”* (Arne Kronemeyer, personal communication, April 20, 2022).

Thus, for example through the resale of a painting, a percentage share flows back to the original creator of the NFT (Arne Kronemeyer, personal communication, April 20, 2022).

A prognosis for the NFT market in Germany also emerges from the expert interview. In the future, only projects that offer the necessary added value and thus bring a benefit behind the NFT will differentiate and therefore establish a long-term presence on the market. The importance of the digital art market is to communicate the values of the NFT and use it as a visual medium. It is about perceiving the benefits behind the NFT and not just seeing the NFT as a simple digital image, according to Kronemeyer (Arne Kronemeyer, personal communication, April 20, 2022).

The expert interview reveals that utility, in particular, is an essential concern for the future. Therefore, it can be seen as a main indicator and is a relevant influencing factor for the hypothesis formation of this Master's thesis.

*H6: Purchase is driven by utility.*

## 4.2 In-depth Interviews

The objective of the interviews is to collect qualitative data regarding the interviewees' thoughts and opinions of NFTs in the German market and to compare and supplement the findings obtained from the expert interview and literature review. The focus was placed on people who already have a deeper understanding of NFTs or who already own NFTs. The knowledge of NFTs that has already been gathered is important to form a concrete opinion on the topic and compare individual perspectives.

Respondent	Age	Sex	Occupation	Location	NFT-Owner
R1	34	Male	Consultant	Hamburg	No
R2	29	Male	Consultant	Munich	No
R3	27	Male	Family Business	Hamm	No
R4	26	Female	Bank clerk	Hamm	No
R5	31	Female	Teaching assistant (TA)	Munich	No
R6	26	Female	Student	Cologne	Yes
R7	17	Male	Student	Bonn	Yes
R8	37	Male	Start-Up	Cologne	Yes
R9	36	Female	Business Development	Berlin	Yes
R10	28	Male	Start-Up	Berlin	Yes

Figure 5: In-depth Interviews demographical overview

In figure 5, ten respondents are listed on the issue of NFT. They are shown anonymously and are labeled R(Respondent)1 to R10. The figure deals with basic information such as age, gender, occupation as well as a place of residence in Germany and whether or not an NFT has been purchased before. The interview with the complete answers can be found in the appendix. Two different interview processes were conducted to differentiate the opinions of NFT owners from non-owners. The owners primarily identified the drivers, whereas the non-owners focused on the barriers.

### Drivers of NFT purchasing behavior in Germany

In the following part, the drivers and barriers are analyzed differentiated, and conclusions are drawn from the respondents' answers.

When analyzing the responses of NFT owners, it is noticeable that R6, R7, R8, and R10 were primarily driven by profits from NFT trading. The respondents mentioned that it is more about quick profits than long-term investments. For R9, the primary reason for buying NFTs was to support the project and team behind the NFT. Four out of five responders who own an NFT have a secondary motivation for doing so – the technology behind an NFT. The actual incentive

set to buy NFTs by the monetary factor is thus underpinned by technological factors which strengthen the interest in NFTs. Two non-NFT owner respondents also mentioned a potential investment opportunity in NFTs as a possible driver. In this context, it was mentioned that in three out of five cases, non-NFT owners' initial thought on the application areas of NFTs relates to the digital art industry. Other areas are completely disregarded.

Focusing on the technology and associated benefits of NFTs, six out of ten respondents agree that “*proof of truth*” (R3) is the most important benefit of NFTs. As described in the literature research, this is a unique property that defines the tokens.

Two additional drivers were identified through the in-depth interviews. Thus, both the non-NFT owners and the NFT owners strongly weighted the monetary aspect as a reason for purchase or initial thought for a potential purchase of NFTs. According to this, six of the ten interviewees associated NFTs with an investment object. NFTs were seen both as a long-term value investment as well as a way to make short-term profits. Specifically, four of the five NFT holders mentioned short-term gains from NFT trading as their primary reason. Only R4 highlighted NFTs as a long-term investment option during the interviews.

*H4a: Purchase is driven by long-term value increases and serves as an investment (more than one month)*

*H4b: Purchase is driven by short term profit (less than one month)*

Based on the expert interview with Arne Kronemeyer, the future of NFTs is based more on the utility of the NFT than on an investment opportunity or the digital art itself. Therefore, the in-depth interviews explored deeper understanding with a focus on benefits in the future. When asked specifically by the ten respondents what they thought about the benefits and opportunities of NFT for the owner and the clearly defined value behind it, six out of ten respondents were of the opinion that there could well be a reversal of the trend and that the previously expressed investment approach could no longer dominate in the future. The technology driver, which was the reason most frequently cited by both groups, supports this theory, as it is the only way to perceive the defined value.

<b>NFT Holder</b>	<b>Uniqueness</b>	<b>Technology</b>	<b>Ownership/ tamper-proof</b>	<b>Support</b>	<b>Investment</b>
<b>No</b>	<b>2</b>	<b>3</b>	<b>2</b>		
<b>yes</b>	<b>1</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>4</b>

Figure 6: In-depth Interviews mentioned drivers

### Barriers of NFT purchasing behavior in Germany

Regarding the barriers to NFT purchases, the respondents' opinions can be divided into two clusters. Here, the non-NFT owners clearly differentiate themselves from the NFT owners. For three out of five non-owners, lack of knowledge is mentioned as a barrier to entering the industry. The obstacles for NFT owners are rather defined by the circumstances with the actual NFT ownership or trade. Specifically, R7, R9, and R10 said they were educated to the point that they had no concerns about buying NFTs.

This suggests different hurdles to overcome when buying NFTs, which can be clustered differently. From the perspective of non-owners, entry into the industry is dependent on having a high “entry barrier” (R2), underpinned by a lack of knowledge (R1, R2, R3) and increased time investment (R2, R3). Predominantly monetary aspects define the second barrier that buyers deal with. The reason for "investment loss" is in first place for R7 and R8, while R6 stated that she would lose her relation to money due to the other currency, Ethereum.

It is also noticeable that half of the respondents, including two non-NFT owners and three NFT owners, stated that they see risks in the NFT industry due to lack of regulation and would not enter the market. Respondents 9 and 10 also mentioned that project characteristics and the associated value could be influenced by the project team, which further reinforces the idea of regulation.

*H5: Non-regulated market has a negative impact on the purchase of NFTs*

<b>NFT Holder</b>	<b>Complexity</b>	<b>Lack of knowledge</b>	<b>Volatility/ Speculation</b>	<b>Overcrowded</b>	<b>No Regulation</b>
<b>No</b>	<b>3</b>	<b>3</b>	<b>1</b>		<b>2</b>
<b>yes</b>			<b>2</b>	<b>1</b>	<b>3</b>

Figure 7: In-depth Interviews mentioned barriers

## **Development of NFT purchases**

The last question deals with the respondents' future assessment of the development of NFTs. Two main statements can be derived from the answers. On the one hand, the focus is on the potential of the technology. The technology factor was already the most frequently mentioned parameter among the drivers. R2, R3, R5, and R8 believe that the technology behind the NFT has the necessary potential to bring new NFT-based tools to the market that will find acceptance among the population in the future. The perspectives of the other interviewees support this argument. They state that it will take time in the future for an optimal benefit of applicability in the population (R1, R4, R10). In this context, R10 adds that large companies' adaptation of NFT-based options can accelerate acceptance among the population if they provide the incentive for usability.

### **4.3 Online Survey**

The survey was conducted from 7th to 13th May 2022. During this period, 136 people filled out the questionnaire. As the work only relates to the German market, the questionnaire began by asking about the German citizenship. 18 persons answered in the negative and were therefore excluded from the survey in advance. The next question asked whether the respondents already had knowledge about NFTs. 19 more people answered this statement in the negative, which meant that this was also not included in the survey. In the survey, a test question was asked about attention, for which there was only one correct answer. One person answered incorrectly and was therefore not considered further in the questionnaire. After adjustment, 98 respondents can be included in the evaluation thus meeting the minimum requirement of 73 respondents.

### 4.3.1 Demographics

Question	Answers	Responses	Percentage
<b>Gender</b>	Male	71	72.45%
	Female	26	26.53%
	Divers	0	0
	Prefer not to say	1	1.02%
<b>Age</b>	Under 18	9	9.18%
	18-30	63	64.29%
	31-45	20	20.41%
	46-60	6	6.12%
	Over 61	0	0.00%
	Prefer not to say	0	0.00%
<b>Education</b>	No School Diploma	2	2.04%
	High School	18	18.37%
	Apprenticeship	11	11.22%
	Bachelor	36	36.73%
	Master	28	28.57%
	PhD	3	3.06%
	Prefer not to say	0	0.00%
<b>Occupation</b>	I am a student	37	37.76%
	I have a part-time job	7	7.14%
	I have a full-time job	40	40.82%
	I am self-employed	14	14.29%
	I am currently not employed	0	0.00%
	I am retired	0	0.00%
	Prefer not to say	0	0.00%

*Figure 8: Survey participants demographical overview*

The demographic data of the people who completed the survey is shown in Figure 8. In terms of gender, 71 respondents (72.45%) were male, 26 were female (26.53%), 0 people described themselves as diverse and one person (1.02%) did not want to state their gender.

Nine persons (9.18%) stated that they were under 18. The largest share of 64.29% (63 respondents) are between 18-30 years old, which is also consistent with the results from the literature review. In the following age group of 31-45 years, 20 (20.41%) of the respondents are in this age group. 6 persons (6.12%) are in the age group of 46-60 and none of the respondents is over 61.

Regarding educational background, two persons (2.04%) stated that they had no school-leaving qualification. Eighteen other persons (18.37%) said they were in high school. An apprenticeship was reported by 11 persons (11.22%) as their highest educational qualification. Thirty-six respondents (36.73%) reported having a Bachelor's degree, followed by 28 respondents

(28.57%) who said they had successfully completed a Master's degree as their highest level of education, as well as three respondents (3.06%) who said they had a Ph.D.

The professional background was asked about the main occupation. Thirty-seven people (37.76%) stated that they were students, a further seven (7.14%) said they had a part-time job. With 40.82% (40 respondents), the largest group reported having a full-time job. In addition, 14 of the respondents (14.29%) were self-employed. Unemployed or retired persons did not participate in the survey.

### 4.3.2 Purchase Behavior

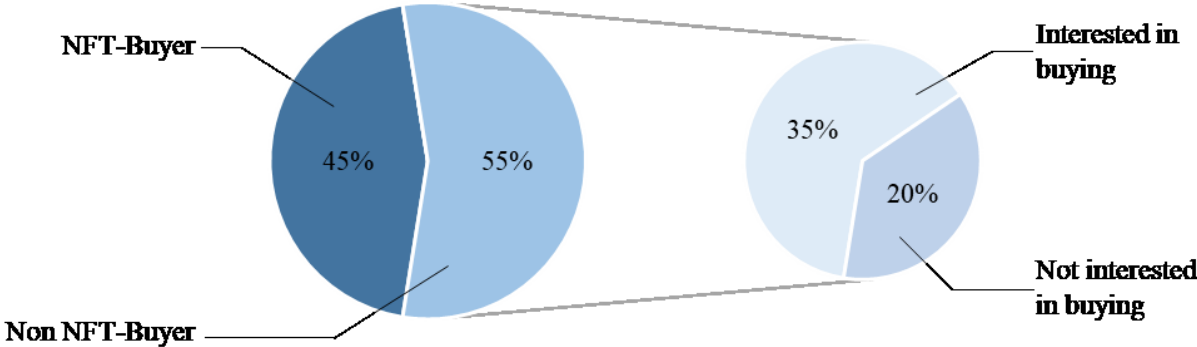


Figure 9: Purchase Behavior Overview

The fourth question of the survey identifies NFT owners. Forty-four people (44.9%) stated that they owned at least 1 NFT. In order to explore the motivations and barriers to purchasing NFTs, the next question asked only those who do not own NFTs. The focus was on whether there is interest in a potential purchase of NFTs. 8 (8.16%) of the 54 non-NFT owners said they were interested in buying NFTs, and another 26 respondents (26.53%) said they were not currently interested in buying NFTs but would like to do so in the future. Since a general affection for both groups of people is evident, they were grouped in the further course.

On the other hand, 17 people (17.35%) said they were not interested while three people (3.06%) were not clear about an NFT purchase. The statements do not reveal any purchase intention, which is why these two categories were summed up in the following.

### 4.3.3 General findings

To test the validity of the extrapolation of the 17 statements, Cronbach's alpha is used to measure reliability and internal consistency (Mark NK Saunders et al., 2019). A Cronbach's alpha of 0.69 was determined, which is close to the acceptance threshold of 0.7 and can thus be evaluated statistically.

In order to accurately identify drivers and barriers in the following work considering the three groups, an ANOVA was performed to determine the different expressions of the means and to find significant differences.

Item	Purchase Behavior			Sum Sq	Mean Sq	F value	Sig. (p-value)
	NFT-Buyer	NFT-Interested	Non-Interested				
NFTs are expensive	3.43	3.53	3.55	0.27	0.14	0.18	0.8396
Digital Art NFTs are not interesting	2.30	2.29	3.10	10.32	5.16	3.89	0.0238
NFTs are temporary hype	2.70	2.97	3.30	5.02	2.51	1.63	0.2016
NFT purchase is easy	3.34	2.79	2.50	11.51	5.76	3.50	0.0343
I am interested because people close to me bough	3.27	3.74	2.70	13.65	6.82	4.06	0.0203
It is easy to get NFT information	2.93	2.88	2.10	10.50	5.25	3.95	0.0224
Digital Art itself is not interesting	2.89	3.32	3.40	5.33	2.66	1.70	0.1878
Interested in opportunity to buy NFTs by card	3.16	3.09	2.75	2.37	1.19	0.78	0.4609
NFT technology is fascinating to me	3.70	3.76	3.10	6.40	3.20	2.89	0.0602
I have knowledge about NFT marketplaces	3.57	3.21	2.60	12.97	6.48	3.29	0.0415
NFT projects are not transparent to me	2.95	3.06	3.50	4.19	2.09	1.50	0.2288
NFT purchase is speculative to me	4.18	4.18	3.90	1.24	0.62	1.00	0.3729
Investment opportunity more than 1 month	3.43	3.47	3.00	3.23	1.62	1.65	0.1981
Investment opportunity less than 1 month	3.57	4.00	3.15	9.43	4.72	4.90	0.0094
NFT market is volatile to me	4.43	4.44	4.10	1.80	0.90	1.74	0.1805
NFTs represent utility to me	3.75	3.68	3.30	2.88	1.44	1.27	0.2856
Cryptocurrency purchase is easy	3.75	3.76	2.50	25.13	12.57	8.69	0.0003

Figure 10: One-way ANOVA - Purchase Behavior

A one-way ANOVA analysis of variance tests the null hypotheses of the NFT buyers with the NFT interested and the non-interested people. In the given study, the significance level is  $p < 0.05$ .

When asked whether digital art NFTs are not interesting, there is a significant difference with an F-value of 3.89 and a p-value of 0.0238. A closer comparison of the means reveals that non-interested persons agree with the statement with a mean of 3.10. NFT owners, on the other hand, find digital art NFTs interesting with a mean of 2.30.

For the statement about NFTs being only a temporary hype, there is no significant difference between the groups with an F-value of 1.63 and a p-value of 0.2016. However, the mean values range from 2.70 of the NFT buyers and 3.30 of the non-interested and thus tend towards

different opinions. For this reason, in the further course of the work, this statement is visually represented with the help of the differentiated Likert scale and the intensity of the expression is examined.

Underlying different opinions can also be seen in the statement about the difficulty of an NFT purchase. With a significant difference with an F-value of 3.50 and a p-value of 0.0343, the opinions of the respondent NFT owners with a mean of 3.34 differentiate from the NFT interested and non-interested to a mean of 2.50.

The question whether the respondents are interested in buying NFTs because people close to them have also bought them shows another significant difference with an F-value of 64.06 and a p-value of 0.0203. Another significant difference (F-value = 3.95; p-value = 0.0224) can be found in the statement whether it is easy to get information about NFTs. The mean values range from 2.93 of the NFT owners to 2.10 of the non-interested.

No significant difference (F-value = 0.78; p-value = 0.4609) can be identified for the statement about the desire for card payments in the NFT market, but the values of the means vary from 2.75 for the non-interested to 3.09 in the middle range for the NFT-interested, to 3.16 for the NFT-owners. Therefore, this statement is also drawn in the data visualization for Likert questions to differentiate between the three groups.

Further significant difference can be identified in the question about knowledge about NFT marketplaces (F-value = 3.29; p-value = 0.0415). The mean values go from 2.60 for non-interested to 3.57 for NFT owners.

Moreover, in the further part of the statements, with an F-value of 4.90 and a p-value of 0.0094, it can be found that investment opportunities less than one month are also attributed to a significant difference. The expressions range from the non-interested with a mean of 3.15, to a mean of 4 for the NFT interested, to a lower mean of 3.57 again for the NFT owners.

A significant difference can also be seen with the question about the simplicity about cryptocurrency purchase (F-value = 8.69; p-value = 0.0003). Non-interested respondents show a mean value of 2.50 here, while NFT owners show a mean value of 3.75.

The ANOVA shows that 8 of the 17 statements have significant mean differences when considering NFT buying behavior in Germany. Thus, it can be seen that NFT buyers differ significantly from NFT prospective buyers and non-prospective buyers, especially when it

comes to parameters related to intrinsic motivation. Thus, in this context, the interest of digital art NFT, buying behavior based on friends and family, as well as short-term investment opportunities are of particular importance. Furthermore, it is also striking that there are clear differences in the groups considered when it comes to the difficulty of buying NFTs and cryptocurrencies or the general procurement of information via NFT marketplaces or NFTs in general.

### **Significant differences among respondents**

In Figure 11, the statements that showed significant differences by ANOVA are examined in more detail. Considering factors derived from the hypotheses, the answers of 3 groups of respondents are compared. People who have already bought NFTs (group 1), people who have not yet bought NFTs but tend to be interested as well (group 2) and people who have not bought NFTs and have no interest in the future (group 3). Thereby, purchase intentions or general interest identify drivers and barriers.

The following factors were analyzed in the survey and the opinions of the groups of people were recorded: Artwork, Technology, NFT Purchase Knowledge, Investment Opportunity, Entry Barrier in terms of buying cryptocurrencies or having a wallet and Non-regulated market as well as the importance of utility. These factors are essential to answer the research questions.

The following figure 11 is visually represented using the standard deviation and means. Response options from 1 to 5 were possible, where 1 stands for "Strongly Disagree", 3 includes neutral opinion and 5 defines itself as "Strongly Agree". The absolute percentages in the figure summarize answer options 1 and 2 (strongly disagree, somewhat disagree) if a dislike of the statement was recorded or 4 and 5 (somewhat agree, strongly agree) if an agreement was recorded.

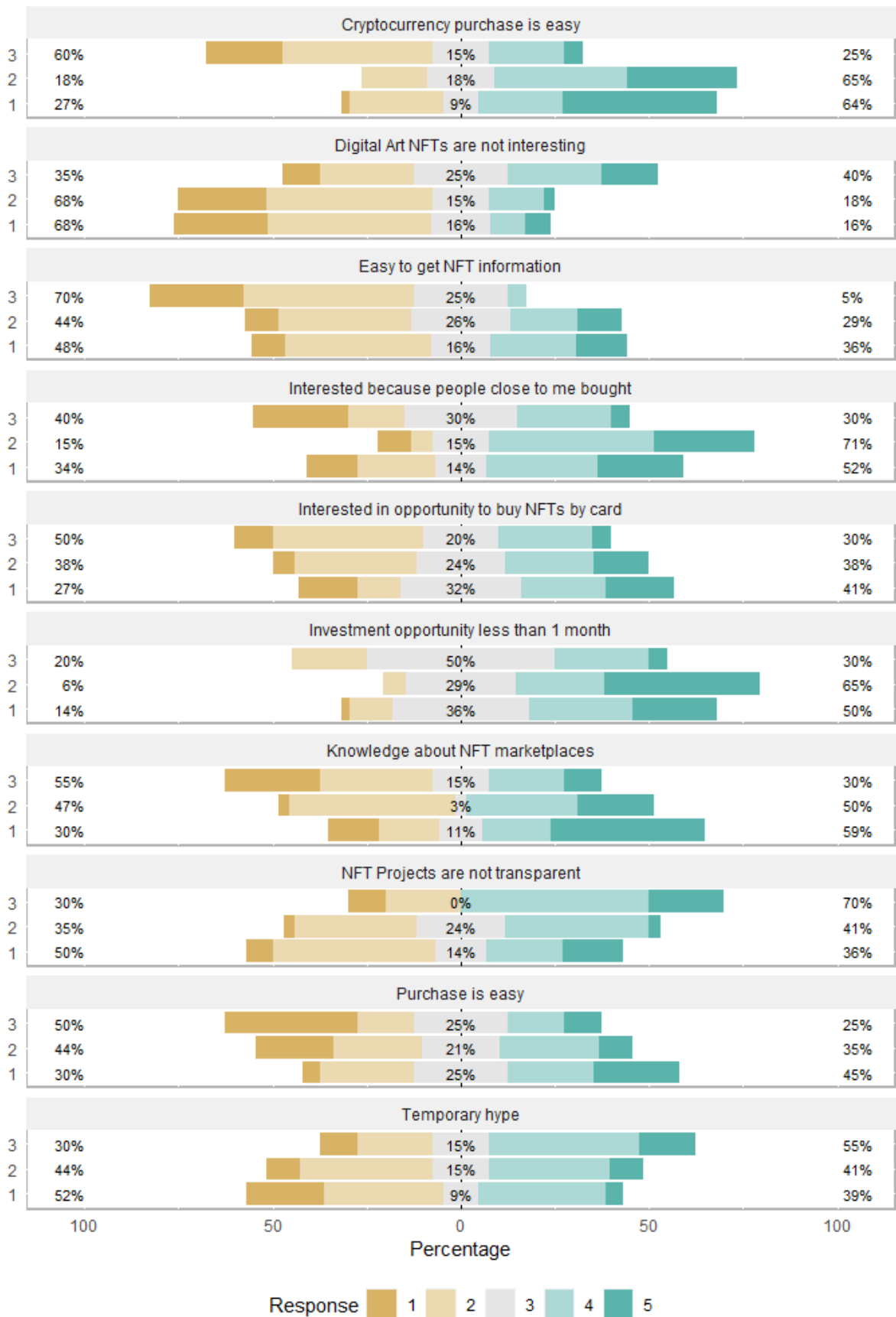


Figure 11: Survey responses taking into account different groups

Starting with the question of the simplicity of cryptocurrency purchase. The three groups of people differ in their opinion on this question. 64% (somewhat agree, strongly agree) of NFT buyers say they find buying cryptocurrencies easy, while 27% (strongly disagree, somewhat disagree) of them rejected this statement. NFT-interested are similar to this statement with 65% agreeing (somewhat agree, strongly agree). People who are not interested in buying NFTs rejected the statement with a share of 60% (strongly disagree, somewhat disagree).

In contrast, when asked explicitly about digital art NFTs are not interested, a 68% (strongly disagree, somewhat disagree) disapproval was received from both interested parties and NFT-purchasers. The agreement of the non-interested dominates with 40% for this statement (somewhat agree, strongly agree).

When asked whether it is easy to obtain information about NFTs, all parties generally reject this statement, the NFT-buyers with a share of 48% and the interested party with a share of 44% (strongly disagree, somewhat disagree). The non-interested party rejected this statement with a share of 70% (strongly disagree, somewhat disagree).

When asked if there is a general interest in purchasing NFTs because family and friends have also purchased NFTs, it is noticeable that the most significant percentage of owners agree with this statement at 52% (somewhat agree, strongly agree). The group of people who do not yet own an NFT but are interested in buying one in general has an agreement of 71% (somewhat agree, strongly agree). With a rejection rate of 40% (strongly disagree, somewhat disagree), there is also no interest among those of the not-interested, even if people close to them have already bought NFTs.

No significant difference was identified by ANOVA for the question about possible card payment for NFTs, but it is still interesting to take a closer look because the means of the groups differ. The group of people who already own NFTs agreed with the statement with the largest share of 41% (somewhat agree, strongly agree). The people who are interested in buying NFTs have a more balanced opinion about this statement. 38% (somewhat agree, strongly agree) of these participants agree with the statement with the same proportion disagreeing (strongly disagree, somewhat disagree). 24% of this group of people are neutral (neither agree nor disagree) in their agreement with the statement. The group of people who are not interested in buying NFTs rejects the statement with a share of 50% (strongly disagree, somewhat disagree).

When it comes to seeing NFTs as an investment opportunity for less than a month, there was favorable agreement among NFT owners and those interested in NFTs. With a share of 50%, NFT owners agreed (somewhat agree, strongly agree) with this statement, another 60%, of NFT interested non-owners also agreed (somewhat agree, strongly agree). Among the non-interested NFT buyers, 50% neutrally agreed (neither agree nor disagree) with this statement.

The survey also asked about knowledge of NFT marketplaces. The largest share, of NFT owners stated with 59% agreement (somewhat agree, strongly agree) to have knowledge about which marketplaces to buy NFTs. The group of people interested in buying NFTs was of a divided opinion. 50% agreed (somewhat agree, strongly agree) with the statement, while 47% disagreed (strongly disagree, somewhat disagree). The opinion was again more apparent among those not interested, with 55% claiming to not know about NFT marketplaces.

About the lack of transparency of NFTs, it is to be mentioned again that there was no significant difference, only a different expression of the means was present. The majority of NFT owners rejected this statement, NFT-interested party, on the other hand, had a split opinion on this statement. 41% agreed (somewhat agree, strongly agree) and 36% disagreed (strongly disagree, somewhat disagree) with this statement. Among non-interested participants, the expression of 70% agreement (somewhat agree, strongly agree) was recordable. Therefore, it can be assumed that the less knowledge there is about NFTs, the less the opinion on transparency about NFT projects will be influenced.

The following statement challenges the initial thought and identifies each participant group's simplicity of an NFT purchase. Expressly, 45% of NFT owners indicated that an NFT purchase would be easy (somewhat agree, strongly agree). The two groups of non-owners disagreed with the statement. Hence, 44% (strongly disagree, somewhat disagree) of those interested indicated difficulty with NFT purchase, while 50% of those not interested also disagreed (strongly disagree, somewhat disagree).

The final statement is also not significantly different according to ANOVA. It deals with whether NFTs are just a temporary hype. The majority of NFT owners voted against it with 59% (strongly disagree, somewhat disagree). Among the interested participants, the opinion on the statement differed. There were 44% against (strongly disagree, somewhat disagree) but also 41% in favor (somewhat agree, strongly agree) of the statement. The third group of people, the non-interested respondents, agreed (somewhat agree, strongly agree) with the statement with 55% and thus confirmed the statement that this is only a temporary hype.

**Driver**

To capture the motivations for purchasing NFT, NFT owners were asked a multiple-choice question after differentiating the three groups of people in the beginning of the survey. They had the opportunity to select the drivers previously identified from the literature review, the expert interview, and in-depth interviews. They also had the option to list additional factors in an open text box. Respondents had the possibility of providing multiple answers to select the indicators they preferred.

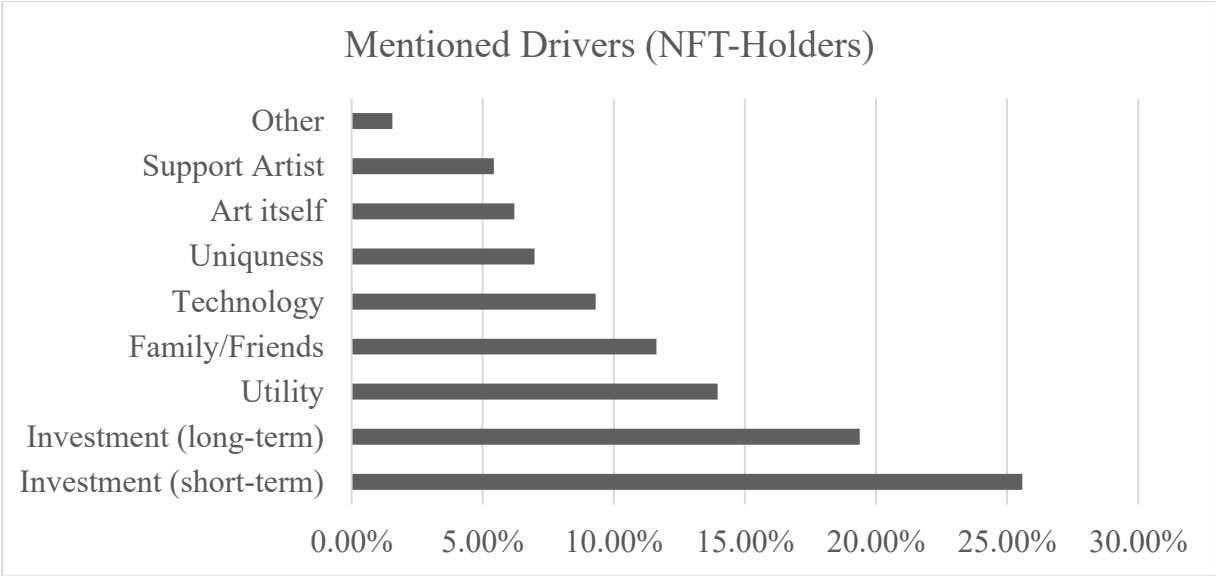


Figure 12: Survey replies to the question "Why did you buy an NFT?"

The majority of respondents, with 33 mentions (25.88%), indicated that the main motive for their NFT purchase was to use it as a short-term investment. 25 times (19.38%) the investment opportunity over one month was mentioned as a driver. The driver recorded by the expert interview, which represents the utility of an NFT, was named third most frequently with 18 mentions (13.95%). The 2 responses (1.55%) captured through the open text field were from artists themselves who have brought their own art to market through the creation of NFTs.

Figure 13 illustrates the drivers that fulfill the null hypothesis and show no significant difference.

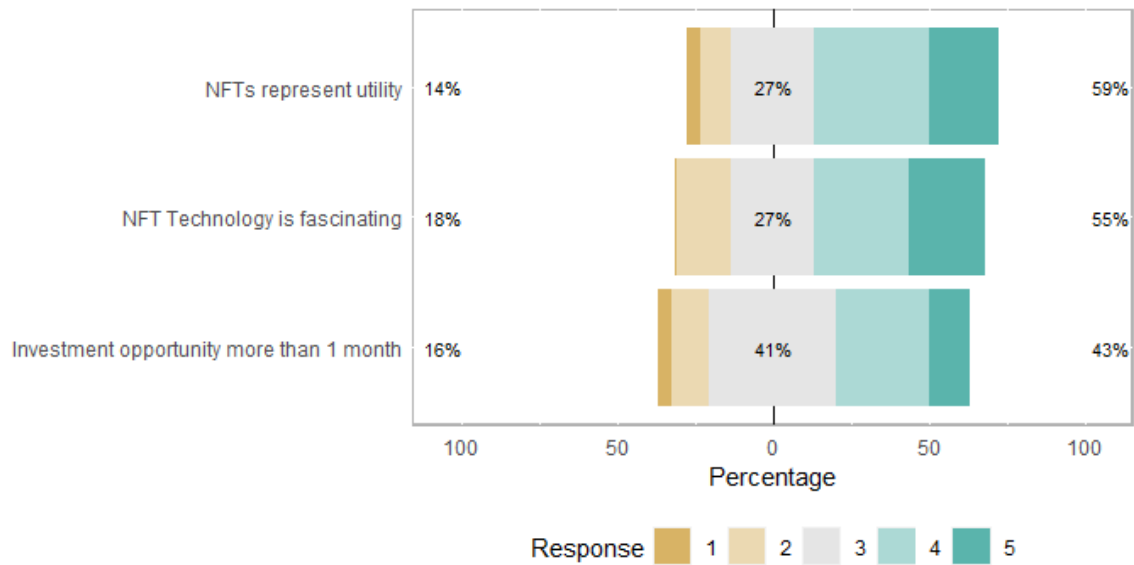


Figure 13: Survey responses for drivers

The multiple-choice question of the NFT owners also underpins the expert interview. With a clear majority of 59%, all three groups confirm (somewhat agree, strongly agree) the statement that there should be a utility behind the NFT. On the other hand, only 14% of respondents disagree (strongly disagree, somewhat disagree) with this statement.

Similar opinions were recorded after the of question whether the NFT technology is fascinating, thereby possible NFT interest was supported. At 55%, respondents agreed (somewhat agree, strongly agree) with the statement, and only 18% disagreed (strongly disagree, somewhat disagree), indicating an essential endorsement of NFTs.

The last driver, which shows no significant difference among the three groups, asks about the investment opportunity for more than one year. The statement received 43% agreement (somewhat agree, strongly agree), with an additional 41% of all respondents being neutral (neither agree nor disagree) to the statement.

## Barrier

The closer look at the barriers, which shows no significant differences among the three groups, is visualized by figure 14.

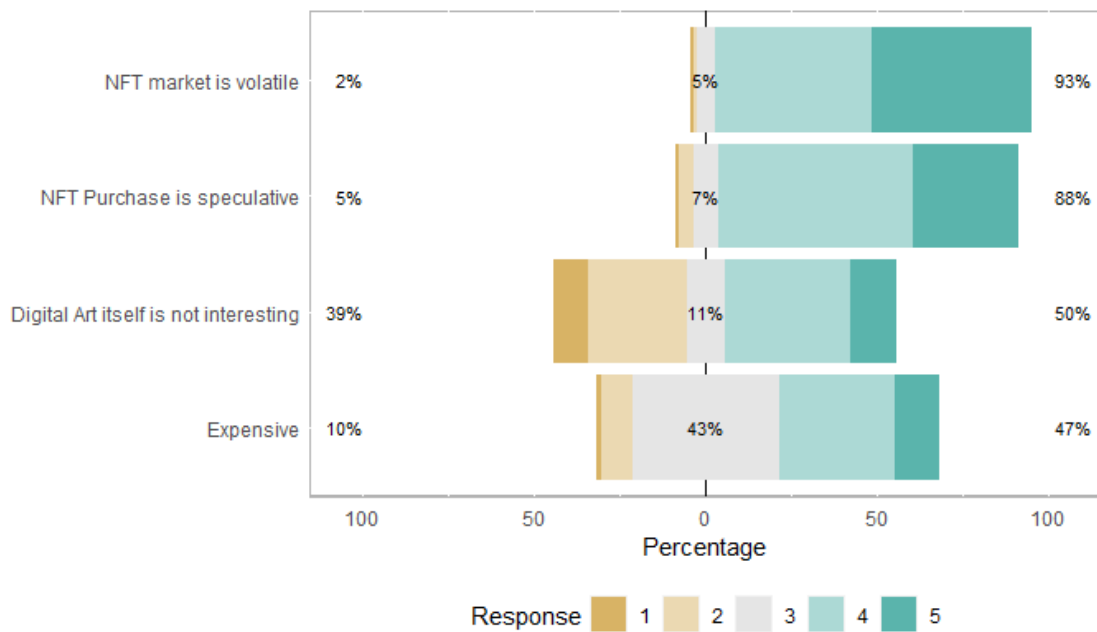


Figure 14: Survey responses for barriers

The following statements refer to the characteristics of NFTs. Thus, in the following, all groups of people above 90% agree (somewhat agree, strongly agree) that the NFT market is volatile.

The subsequent statement deals with whether an NFT purchase would be a speculative decision. All three groups surveyed had over 80% unanimous agreement (somewhat agree, strongly agree) with this statement.

When asked if the NFT market is too volatile and thus inhibits a purchase, 93% agreed (somewhat agree, strongly agree) and confirmed the statement.

The following question builds on the volatility and explicitly questions whether the NFT purchase is associated with speculation, and thus also establishes a reluctance to buy. All respondents confirmed this statement with 88% (somewhat agree, strongly agree).

50% confirmed the statement (somewhat agree, strongly agree) that digital art is not interesting in itself and thus confirmed the barrier based on the 50% criterion. The in-depth interviews previously revealed that acceptance of digital art itself is low. Therefore, the statement was formulated negatively.

The final statement questions whether NFTs are expensive. The result was that 47% agreed (somewhat agree, strongly agree) with the statement, but just missed the 50% criterion. Another notable part of the respondents with 43% is undecided (neither agree nor disagree) about the statement.

## 5 Discussion

After evaluating the survey, the next step is to apply the findings to the hypotheses. The findings from the expert interview and the in-depth interviews are also used to discuss the hypotheses. The hypotheses are discussed considering the three groups of people, the NFT buyers, the NFT interested parties and the non-interested parties, in order to identify the drivers and barriers as best as possible and apply them to the hypotheses. Of the initial 136 participants, 98 are therefore included in the discussion. The hypotheses are only validated according to a criteria if "Somewhat agree" and "Strongly agree" together reach more than 50 percent in the surveys, as well as only rejected if "Strongly disagree" and "Somewhat disagree" combined reach more than 50 percent on the other hand.

*H1: Purchase is driven by the artwork*

NFTs are represented on a blockchain, which shows the immutable files as an image primary. The visual appearance is the first and tangible reference to the NFT and could thus influence potential purchase decisions. However, because the visual appearance of an NFT is essential but gained minimal acceptance in the interviews, the statement was negated in the survey in order to investigate dislike. By recording the purchase motivation of NFT buyers, digital art was only mentioned as motivation with a share of 6%. Also, in the general survey, 50% of all participants stated that they were not interested in digital art, thus fulfilling the criterion. Therefore, the hypothesis is rejected and does not serve as a driver for the purchase of NFTs.

*H2: The technology has a positive impact on buying behavior*

The uniqueness of the NFT is characterized by the technology. Through decentralization on the blockchain, NFTs bring a new disruptive way of transferring and attributing data as well as the exact identification of the proof of origin. For this reason, the second hypothesis is based on the adaptation of the technology as a reason to buy an NFT. Through the in-depth interviews, the technology was mentioned by all NFT owners as one of the driving reasons for buying an NFT. Non-NFT owners R1, R3 and R5 supported this statement that technology was the key motivator to consider the unique tokens.

Furthermore, in the survey, 55% of all respondents agree (Somewhat agree; Strongly agree) that the technology is fascinating and therefore arouses the interest to have a more detailed look at NFTs. It is not surprising that the technology influences the purchase decision, as this is defined as a fundamental attribute of an NFT. Thus, the hypothesis that technology defines a

driving factor as a reason to buy is validated under the 50% criterion. The extent to which the background of the technology – the associated utility – is important is tested by hypothesis 8.

*H3: The entry barrier is too complex and thus has a negative effect on potential buyers.*

The literature review indicates that NFTs, due to the disruptive technology, require new knowledge for individuals to interact with the tokens. This view is reflected in the responses of the in-depth interviews as well as in the survey responses. In the in-depth interview, R2 stated that the entry barrier was too high and that adaptation to the use of NFT was not occurring at his site at the current time. R3 shared a similar opinion and added that he did not know where to start to inform himself about a potential purchase and to what extent he should acquire the knowledge. R1 and R5 also associated the NFT purchase with too much complexity. The negative view, of the non-owners in the in-depth interviews, was also substantiated in the survey.

Regarding the statements that it is easy to buy NFTs and easy to get NFT information, those interested in NFTs rejected with the majority, but did not meet the 50% criterion. On the other hand, people who have knowledge about NFTs but are not interested in buying them rejected the statements and hence the hypothesis. Knowledge about NFT marketplaces is also clearly rejected by the non-buyers, whereas those, who are interested in buying show a marginal agreement of 50% in this regard, thus confirming the statement. Consequently, non-purchasers continue to hold a negative perception of information acquisition. Individuals who already own NFTs support the findings about the relative ease of purchasing NFTs and obtaining information.

*H4a: Purchase is driven by long-term value increases and serves as an investment (more than one month)*

*H4b: Purchase is driven by short-term profit (less than one month).*

In the in-depth interviews, it came out that the main incentive for buying an NFT is the financial aspect. In this context, the interviewees indicated both short-term investment opportunities as well as long-term ones. R6, R7, R8, and R10 stated that they started trading NFTs because of the possibility of quick profits. The multiple-choice question also confirms this statement, which was only asked NFT owners at the beginning of the survey. The main drivers recorded were a long-term increase in value with 19% and short-term profit with over 25%.

The survey confirms the view of NFT owners and NFT interested parties who meet the criterion of using NFTs as an opportunity for short-term gains. In contrast, 50% non-interested respondents are undecided regarding the short-term gains statement. When looking at investment opportunities longer than one month, no significant difference is evident, with 43% agreeing and 41% neutral across all respondents. Therefore, no definite clearance can be granted in the long run. Nonetheless, a basic approval can be documented.

*H5: Non-regulated market has a negative impact on the purchase of NFTs.*

It emerged from the in-depth interviews that the market for NFTs is not regulated and players do not have to abide by market conditions. As a result, NFTs and their value are not certain, even if there is a verifiable attribution to ownership. It is the responsibility of the creator of the NFT to determine whether the utility and associated value will remain stable.

The survey investigated the general perception of the participants regarding the unregulated market based on three statements. According to the demand of the market's volatility, a clear confirmation with over 93% of all participants agreed with the opinion that the NFT market is volatile. The statement based on it concerning whether the market is associated with speculation was also agreed to by 88% of the respondents.

In addition, NFT owners can never really be sure what will happen to the value of their NFT. R8, R9, and R10, targeted the fact that the uncertainty associated with a purchase is pervasive and stands as a major disadvantage behind NFTs.

The survey asked the statement about the transparency of NFT projects or artworks. The opinions of the participants show a significant difference about the lack of transparency. Thus, half of the NFT owners disagree with this statement. Non-owners, on the other hand, agree with the statement with 51%, confirming the hypothesis of lack of transparency about NFT purchases. Fundamentally, this confirms the hypothesis. Many uncertainties strengthen the barriers to purchase, especially for non-NFT owners.

*H6: Purchase is driven by utility.*

Through the expert interview, another driver essential to the sustainable persistence of the NFT was added – the utility. It is essential in order for the NFT to maintain its value in the long term. The majority of all respondents meet the criterion and support the hypothesis that the utility behind an NFT, drives the purchase. The utility was also cited as the third most common reason

(13.95%) for purchase intention from the multiple-choice answer for NFT owners, further strengthening the hypothesis.

## 6 Managerial Implications

The insights gained enable a whole new interaction between company and customer and show enormous potential. The move from Web 2.0 to decentralized Web 3 promotes control of the data of the individual. By tokenizing digital data, it makes an asset transportable on the blockchain. It does not matter whether the asset is digital or physical in origin. In theory, NFTs can thus be transferred and applied to any industries and divers' categories, and therefore be implemented as a tamper-proof token.

The implementation of NFTs can bring decisive advantages. The primary emphasis is on industries that sell tangible or digital goods. With respect to physical assets such as limited-edition vehicles, real estate, or watches, the NFT can be traded as a digital certificate of authenticity. For example, limited MP3 files can be tokenized in the music industry, and thus digital quantities can be recorded and tracked. In this context, special privileges may also be recorded and connected to unique advantages.

NFTs may also become an integral element of marketing departments, since consumer loyalty can be measured and promoted with precision. By participating in programs and promotions, customers can benefit from exclusive discounts or individual privileges. However, access to these benefits is only possible if the necessary NFTs are in possession of the customer.

The digital brand and product experience can also be promoted through the integration of NFTs. In metaverses as well as augmented and virtual reality, digital assets can be assigned a concrete value. A link can be created between digital assets for avatars, with real products, for example. More broadly, adaptation can precisely identify individual products through proof of authenticity and ownership, enabling replicas to be identified.

Hence, barriers can be invalidated by setting incentives and breaking through obstacles. The system needs to allow for the purchase of NFTs with card payments, as identified in the research. Furthermore, all necessary information should be transparent and bundled in a way that can be understood in order to bring the broad population for the adaptation of NFTs in the corporate world. In this context, the focus should always be on the potential value behind the NFT to convey sustainable and long-term value. To ensure longevity, the company must be in harmony with the product and the value that goes with it.

Companies that implement NFTs can thus influence and increase brand awareness in the long term and perceive an entirely new opportunity for customer engagement. Interaction with the

end consumer can be fostered, and experiences created that underpin innovation and reinforce interest in the brand and products.

## 7 Conclusion

The thesis findings contribute significantly to the scientific results of NFT purchase behavior and related drivers and barriers in Germany. The NFT market in Germany was recently considered to be a relatively unexplored market and therefore hardly provided any information. The thesis provides fundamental insights into the German market regarding the NFT buying behavior of Germans. New information enables a more detailed comprehension of buying intentions and an appreciation of obstacles.

The expert interview, the ten in-depth interviews, and the 98 analyzable survey results collected both qualitative and quantitative information that answered the research questions and hypotheses. The insights gained complemented the existing literature, which is primarily limited to the international NFT sector and hence does not provide specific insights into the German market.

Decentralized data transmission on the blockchain allows files to be stored in a tamper-proof manner. Existing information in the literature highlighted the intricate nature of NFTs' complexity. Due to the unique technology, a basic understanding had to be acquired first to grasp the actual problem. Consequently, the required understanding of the technology is a significant barrier to the purchase of NFTs. However, since the NFT market is experiencing an upward trend and thus many people are engaged in the adaptation of NFTs, continuous changes that lower the barriers are also conceivable in the future. Nonetheless, the complex technology provides new benefits, most notably the ability to combine the NFT as a digital asset with linked traceable value and thereby seize new opportunities in both the digital and physical worlds.

In order to accurately capture the buying behavior of NFTs, three different interest groups about the topic were captured and compared. The focus was on ensuring that participating individuals brought prior knowledge about the topic in order to draw the best possible conclusion from the data collected. The three groups surveyed were composed: The first group is individuals who have already purchased NFTs. The second group includes non-buyers, but those who are interested in a potential purchase. Group 3, on the other hand, has knowledge about the topic, but rejects a potential purchase.

Through the comparison, it became apparent that the opinions of the groups are factor-dependent and differ significantly in individual topics. The commonalities of all groups showed that the short-term investment thought is the main characteristic of an NFT purchase. The

associated benefit behind an NFT is also a decisive reason for purchase. This is underpinned by the technology itself, which appears complex in the first instance, but on the other hand brings groundbreaking possibilities and is therefore seen as an important factor.

The significant differences between NFT owners and non-owners lie in the hurdle of purchasing the NFT. Thus, the purchase is accompanied by difficulties, which is a high entry barrier that must be overcome first by non-owners. Another salient significant factor supporting purchase is that NFT interested have the intention for purchase through family and friends.

Specifically for NFT interested party, barriers can be overcome with the necessary knowledge and lead to a purchase. The driving factors that define an NFT are surmountable in relation to the entry barrier if the benefit is kept in mind and the advantages are leveraged. Since these benefits can be essential technology advantages for companies, the thesis recommends implementing NFTs in companies that primarily trade and sell valuable goods in order to provide a general added value for both the company and the end consumer. This reinforces both product and brand loyalty and may provide sustainable value.

This study establishes the foundation for the German NFT market. It can be assumed that with increasing purchase volume and adaptation of companies, the purchase incentive for the general population will be strengthened.

# 8 Appendix

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**Expert interview:** (Arne Kronemeyer, personal communication, April 20, 2022)

1. Have you ever bought an NFT? If yes, how many?

I have already bought a few, probably 20-30 pieces already.

2. When was your first purchase?

Last November (2021) was my first purchase.

3. Why did you buy an NFT?

In the first step, it was because I have been involved with crypto per se for a very long time. My first points of contact with crypto were already in 2017, so I have always kept an eye on new connected technologies that have to do with crypto or are based on it.

When the demand for NFTs in the art market became bigger, one reason was that I wanted to understand the hype. So, I would say that the intention for the first purchase was rather to understand the "hype". But I was particularly interested in the technology behind it and how it works in general. I simply wanted to take a closer look at the topic and understand it so that the initial reason would be curiosity and interest.

4. How did you come across NFTs in the digital art market?

I move around a lot in the crypto space, actually everything in the web3 area that is connected with new technologies and trends. In my opinion, I always grasp this very early and then also very deeply in order to gain that knowledge. But also, through my software company, we always search for new possibilities to improve our customers web experience. And when the bubble got bigger last year, I wondered why the general interest suddenly increased so much.

5. What exactly interests you about NFTs in the digital art market?

In the beginning, it was indeed the hype that made me focus on the NFTs. Now, however, the value is in the benefits, in what can be achieved with NFTs. So, whether it's royalties for musicians who can let their community earn money and share their success. Whether it's tickets or gated communities or its exclusive access to festivals. Basically, it's about the utility that is behind an NFT, and what possibilities it has. So, to use this possibility as an instrument, in the end, is very appealing to me. Based on the new technology, this is a revolution as the artists or developers of the NFT can profit from the resale forever. For example, if you have a painting,

you only get money the first time you sell it. Through NFTs you also have the advantage that if you make a name for yourself in the course of your career and your works are sold on, you still earn a percentage of the sales value and thus also of your "made" name and the increase in value.

6. Were there any obstacles to the purchase of NFTs?

For me, there was no concern about buying NFTs, but that is also because I am always very deeply involved with the technical aspect. For example, crypto in general, but also in relation to the functioning of wallets, trading or transactions on the blockchain. That's why I've already dealt with it a lot. This meant that it was no extra effort for me to, for example, create a wallet. I also already know the marketplaces, where I have to go and how it works, so the purchase itself was not an issue at all.

7. How do you see the future of NFTs?

I think that in the short term it will remain a very niche market for the next 1-2 years, but with increasingly more important and sophisticated utilities. It will be about creativity, what you can actually do with NFTs. As already said, whether it is used as a gate for a community, whether it can be redeemed in the real world or Web2, for example for certain items or the like. In my opinion, there are many ways in which you can combine NFTs with the necessary added value. The important thing is to detach yourself from the hype and focus on the project or the team behind the NFT. I believe that this is how it will establish itself in the medium term. I see many new opportunities arising from the potential of NFTs. But it's important to keep in mind, that the digital art market will be just a method of communicating values, but it will work very well if you approach it the right way.

8. How do you see the detailed development of the digital art market?

I think NFTs will open up many new areas as I said. For example, there is an interesting project by an artist who has his own gallery and also paints physically in the offline world. His approach is as follows: He paints each picture and creates an NFT of it at the same time. In the following step, the buyer could then buy the NFT of the painting and go to the gallery and redeem it. In the next step, you have to decide whether you want to give up the NFT and go for the physical painting, or just keep the NFT and give up the painting and let it be destroyed. This opens up completely new possibilities in the world of digital art, which have enormous potential with the connected utilities. So, I see a lot of great opportunities when creativity meets utility.

9. So, if NFTs are used correctly in the digital art market, you see a lot of potential?

Yes, you can see that the market is currently stagnating, if not slightly decreasing, the peak of the hype was already 3-4 months ago. Now it's about getting the focus from hype to applicability and using the potential of NFTs. Basically, there are still many fields of action open from which one can learn a lot and which reveal possibilities for artists. It is important to differentiate which benefit the artworks pursue and then derive the value of the NFTs from that. Only in this way can NFTs be sustainably integrated into the art market.

[...]

### **In-depth Interview Questions**

Introduction: Name, Sex, Age, Living Place, Profession

Topic 1: Opening question (for all)

1. Have you ever bought an NFT? If yes, how many?

Topic 2A: NFT Questions for people who have not bought

1. What exactly is an NFT, according to your understanding?
2. What are the potential application areas for NFTs, to your understanding?
3. Are you interested in buying an NFT?
4. Why are you (not) interested?
5. What are the specific obstacles for you?

Topic 2B: NFT Questions for people who have bought

1. When was your first purchase?
2. Why did you buy an NFT?
3. How did you come across NFTs?
4. What is it about NFTs that appeals to you?
5. Were there any obstacles to the purchase of NFTs?

Topic 3: General questions about NFT potential

1. What do you see as the main advantages of NFTs?
2. And what do you see as the disadvantages?
3. How do you see the future of NFTs?

## In-depth Interview Summary

### Introduction Question

Question	Answer
Have you ever bought an NFT? If yes, how many?	R1: No R2: No R3: No R4: No R5: No R6: Yes, more than 15, I would say. R7: Yes, I bought around 40 so far. R8: Yes, four. R9: Yes, but only one. R10: Yes, I bought 6 overall and flipped one of them

Question	Answer
What exactly is an NFT, according to your understanding?	R1: It is a unique "code" that embodies something specific and can thus be assigned a value. Moreover, this code cannot be replicated and is unique. R2: Through blockchain technology, a value that can be represented in the decentralized digital world can reflect originality. R3: Non-interchangeable digital objects that can be clearly assigned. R4: On the one hand, I see NFTs as a long-term investment option, provided that there is a particular reputation and value behind the NFT. On the other hand, it is a technology from Web 3.0 that supports decentralization. R5: I know it's a token on a blockchain that is assigned a value.

Question	Answer
When was your first purchase?	R6: in August 2021 R7: My first purchase was in August 2021 R8: Beginning of October 2021 R9: on July 27th, 2021 R10: second week of April 2022

Question	Answer
What are the potential areas of application for NFTs to your understanding?	R1: I know an interesting example in the fashion world. Certain clothes can be used and "put on" as NFTs in the metaverse. This gives your unique avatar clothes. But I think NFTs are also a trend in the art scene currently. R2: Currently, I see the areas of application primarily in the art industry but also in the metaverse. In the future, however, many more application areas are possible that will be executed with the help of smart contracts. For example, it will be a promising tool in the insurance industry. R3: Potential investment opportunities in digital art. R4: It is digital investment opportunity on a long-term basis.

	R5: Actually, everything that has a certificate of authenticity, whether physical objects like cars or digital ones like works of art.
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Question	Answer
Why did you buy an NFT?	<p>R6: Primarily because of the quick money. Afterward, the innovative technology became more and more interesting because you have ownership rights.</p> <p>R7: I bought my first NFT primarily to make money in the short term. Later on, strong concepts came along that interested me, embodied the value of NFT, and thus piqued my interest.</p> <p>R8: My main focus was the possibility of earning a lot of money in the short term.</p> <p>R9: The World of Women project caught my attention, and I wanted to support it. I was fascinated by the possibility of using an NFT because I had already been involved with the technology through my job.</p> <p>R10: I was always curious about the industry and researched a lot. But in the end, you have to be part of the ecosystem to learn and understand it. That is why I purchased my first NFT, which gives access to a discord group with Alpha calls and tips &amp; tricks for the NFT market. Therefore, I learned a lot here</p>

Question	Answer
Are you interested in buying an NFT?	<p>R1: I am not quite sure yet.</p> <p>R2: Not in the short term, let's see how the NFT-market will develop</p> <p>R3: Not really. At least not in the near future.</p> <p>R4: In terms of investment opportunity, NFTs are too volatile for me, and there are better ways to invest, in my opinion.</p> <p>R5: In itself, yes.</p>

Question	Answer
How did you come across NFTs?	<p>R6: Through my brother, who told me about it.</p> <p>R7: Through a community on Discord (Social media platform)</p> <p>R8: Through friends who told me about it.</p> <p>R9: I came to NFTs through my previous job. There, we researched disruptive technologies and came across NFTs and the general possibilities of blockchain technologies.</p> <p>R10: I came across NFTs the first time in 2020 through Gary Vaynerchuck.</p>

Question	Answer
Why are you [not] interested?	<p>R1: The opportunity has not yet arisen for me, or I simply don't see any possible area of application that I could use with an NFT.</p> <p>R2: At the moment, I don't see any added value, detached from the digital world. For me, NFTs are still too speculative and have no tangible reference.</p> <p>R3: I have no interest in investing in classical NFT art. I prefer to rely on proven investment methods.</p>

	<p>R4: [look at previous question]</p> <p>R5: But I don't know where I would personally apply it in my everyday life or where I could use it, I don't really see any added value in it yet.</p>
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Question	Answer
What is it about NFTs that appeals to you?	<p>R6: I like the projects behind the NFTs, especially the communities. Everyone is always helpful and strengthens each other because everyone pursues the same goal. Everyone shares their insights and is open with each other.</p> <p>R7: If you know how to do it, you can make a lot of money with it quickly and easily. I'm also attracted to decentralized technology because everyone has the chance to start, and everyone is on an equal footing.</p> <p>R8: At the moment, I'm attracted to NFTs in the art market; with the necessary knowledge, you can quickly make a lot of money. But the technology itself is super exciting and can bring about some disruptive changes in everyday life in the future.</p> <p>R9: You can support projects, organizations, and people in the simplest ways without distortion. The verification of authenticity makes this possible without hesitation.</p> <p>R10: Right now, definitely the monetary value that can be achieved by flipping NFTs. As I work in an NFT start-up, I also see the bigger picture of the industry. NFTs offer a lot of utility in different areas.</p>

Question	Answer
What are the specific obstacles for you?	<p>R1: I don't have the knowledge to get started. For me, the whole thing looks pretty intransparent from the outside. In my opinion, potential customers and interested parties are not reached through all possible channels. It feels like a "black hole" like 15 years ago with the internet. There are currently too many things you have to deal with to gain the necessary knowledge.</p> <p>R2: A lot of knowledge is required, which I don't have. In my opinion, there is a high entry barrier. An intensive research of NFTs is necessary to foresee a possible performance in the future. Comparatively, much more time is needed than with traditional investment opportunities.</p> <p>R3: I would probably have to spend a lot of time buying an NFT in good conscience. Also, questions come up like, on which platform do I buy which NFT. Transparency is essential, and this is not given. Moreover, I do not understand the technical feasibility.</p> <p>R4: The market is not regulated, and there are no controllable or visible mechanisms, that's why I have doubts.</p> <p>R5: I find that NFTs are much associated with money laundering, which is quite suspicious to me. But also that it's all in cryptocurrencies, and since I don't use those, it doesn't make that much sense to me.</p>

Question	Answer
Were there any obstacles to the purchase of NFTs?	<p>R6: Through the currency "Ethereum," you lose the relation to money. The amounts often seem very small, even though they are several hundred euros.</p> <p>R7: I was well informed about possible risks by my friends, so I didn't think too much about it. [...] Investment loss was my biggest concern, if any.</p> <p>R8: As it is not a regulated market, I was afraid of losing my investments.</p> <p>R9: Since I had previously dealt with it both professionally and privately, I was aware of all the risks.</p> <p>R10: No not at all, as I purchased my first one off a secondary market (Opensea). The others I was able to mint directly, as I got on the Whitelist</p>

Question	Answer
What do you see as the main advantages of NFTs?	<p>R1: Tokenisation allows a unique value assigned to a tangible or even intangible asset. This can thus penetrate the natural world and theoretically be assigned to everything.</p> <p>R2: A proof of truth can reflect the origin of a digital asset.</p> <p>R3: The technology behind the NFT is super exciting but also complex. Understanding how transactions or the creation of NFTs work is a significant advantage.</p> <p>R4: An NFT is attributed a unique value that makes it tamper-proof. It also makes it possible to accurately identify a person's belonging.</p> <p>R5: For me, the biggest advantage is that it is forever traceable who owned it and when, and all information related to the history and parameters of the NFT is stored.</p> <p>R6: Blockchain technology is unique, and one can clearly assign digital goods and thus confirm their originality. Moreover, the technology can be adapted to different application areas.</p> <p>R7:</p> <p>R8: I only see proof of authenticity as an advantage in the art market. In general, however, the technology has a lot of potentials and can disempower large corporations in the future through decentralization and the new data origins.</p> <p>R9: Of course, the immutability but also the pride of ownership and support for creative work and art is much more achievable</p> <p>R10: NFTs enable the liquidation of illiquid assets. Even though people only own the token of the asset and not the picture/asset that itself, it offers a lot of opportunities in terms of ownership. As NFTs are stored on the blockchain, they give a secure ownership. Also they are easy to transfer, which allows trading opportunities.</p>

Question	Answer
And what do you see as the disadvantages?	<p>R1: At the moment, it is too complex for me to understand possible disadvantages.</p> <p>R2: You have to acquire a lot of knowledge to overcome the entry barrier.</p>

	<p>R3: I find the topic too complex and see it challenging to invest in NFTs in the short and long term.</p> <p>R4: Strong volatility and investing in the right project, artwork etc. are underpinned by a lot of speculation in my opinion.</p> <p>R5: For me, the biggest disadvantage is the accessibility and that you need a wallet with the related currency.</p> <p>R6: The NFT market in digital art is currently overcrowded and, in my opinion, will therefore decrease in volume in the future.</p> <p>R7: You can never trust 100% in a project, often, you have to speculate, and then you may lose your investment.</p> <p>R8: Due to the decentralization of the market, no solutions have yet been found to regulate it.</p> <p>R9: I own an NFT, but that does not mean I have control over it. So, the team behind the project can change constraints or parameters, which changes the “diversity.”</p> <p>R10: From an investing point of view it is always difficult to say if an NFT has a real value. Most of the NFT projects could go to zero and do not offer any real value to the owners. Thefts such as rug pulls are also a great problem in the industry, as some creators offer an NFT project for minting and then make a cash grab and leave the project, which leaves the holders with a financial loss.</p>
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Question	Answer
How do you see the future of NFTs?	<p>R1: If channels are created that are easily accessible to everyone, adaptation is possible much faster than today. The leap to the "real" world may still take some time, but I see a lot of potential in the digital space in the short term.</p> <p>R2: The application areas of NFTs will change in the future and gain acceptance among the population. The trend will move away from digital images and relevant technological tools that rely on NFTs.</p> <p>R3: Classic NFTs today should evolve to embrace and exploit the technology entirely.</p> <p>R4: The areas of application will expand considerably, but I cannot judge whether the population will find it appealing.</p> <p>R5: I think the future is actually good because of this new technology that NFTs bring with them. Especially through Corona, digitalization has advanced more and more and several areas have been digitalized that could possibly be interesting in relation to NFTs in the future.</p> <p>R6: The digital art market will focus on a few dominant projects. The potential behind decentralized blockchain technology is much more significant and will bring much change in the future.</p> <p>R7: It is still possible to make money on the digital art market through speculation. You need to find the right niche and invest at the right time.</p> <p>R8: Given the primary conditions, it is an excellent way to protect your digital property and prove ownership. This could become very interesting for various industries in the future.</p> <p>R9: It is much easier to support projects via blockchain technology and certificates of authenticity. But the basic idea of decentralized data exchange is not yet exploited to its full potential.</p>

	R10: The future for NFTs is bright. There are huge opportunities in a lot of different industries. NFTs will become the assets in the metaverse, even though no one really knows what the metaverse will look like. As we are moving towards a more and more digitalized world, NFTs will play an important role. Furthermore, a lot of big companies invest heavily into the industry and there are more and more crypto funds created, which indicates that NFTs will play a bigger role in the future.
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Question	Answer
How do you see the future, in terms of a clearly defined utility that reflects opportunities and benefits in an NFT? Will this become a relevant aspect for the digital art market?	<p>R1: If the value is easily communicated, and offers an overall added value, it definitely makes NFTs more attractive.</p> <p>R2: Yes definitely, as I said before, I see the future in the specific application of an NFT and more as a tool than a simple image. So the benefits that come with it can offer new possibilities, for example, to support projects and in return get access to unique items.</p> <p>R3: Yes, I think so, with the full utilization of the technology you can also create new benefits and profit from it in the long run. But it will still take time before this can be applied to everyday situations.</p> <p>R4: If the benefits are generally apparent and thus offer added value for the population, but at the same time the named barriers are reduced, the benefits can support the appeal of an NFT. But I can't say how this is reflected in the digital art market in particular.</p> <p>R5: Yes, if the technology in general becomes more popular, I also see more possibilities for the application of NFTs through a clearly demonstrated benefit. The art market can perhaps benefit from the fact that buyers are always in relation to the artist and thus make the art traceable.</p> <p>R6: Yes, I think it is actually already a decisive factor and I also think that it will become even more important in the future. In relation to the digital art market, however, this will not be as evident as in other areas of application. For example, you can use NFTs as a shareholder opportunity, so a single NFT is your "share" and you get the utility from that.</p> <p>R7: At the moment I see the digital art market as an opportunity to make a quick profit, but if the meaning behind the images is deepened and the reason for buying them is utility, the quick trade in NFTs could become unattractive and focus more on long-term retention.</p> <p>R8: Specifically for the digital art market, I don't see utility as a selling point because the artwork is actually dominated by demand. Other areas of application, such as music, can benefit more from it, creating unique opportunities to support the artist or let the buyer benefit from it.</p> <p>R9: In any case, the benefit behind my NFT, which I bought, was also the decisive argument for buying it. First and foremost, I just wanted to support the project and further the cause, which made me part of a great community. The unique value behind the NFT should always be the primary reason when buying one.</p> <p>R10: Yes, in the digital art market utility can be reflected through different possibilities. So-called "staking", passive income or</p>

	"breeding" are ways to gain long-term utility through NFTs on the decentralized web.
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### Mentioned drivers

Respondent	NFT Holder	Uniqueness	Technology	Ownership/ tamper-proof	Support	Investment
R1	No	x	x			
R2	No	x				
R3	No		x			
R4	No			x		
R5	No		x	x		
R6	Yes	x	x	x	x	x
R7	Yes		x	x		x
R8	Yes		x			x
R9	Yes		x	x	x	
R10	Yes		x	x		x

### Mentioned barriers

Respondent	NFT Holder	Complexity	Lack of knowledge	Volatility/ Speculation	Overcrowded	No Regulation
R1	No	x	x			
R2	No	x	x			
R3	No		x			x
R4	No			x		x
R5	No	x				
R6	Yes				x	
R7	Yes			x		
R8	Yes					x
R9	Yes					x
R10	Yes			x		x

## Survey Questions

Q1 Are you a German citizen?

- Yes
- No

Q2 Do you know what an NFT (Non-Fungible Token) is?

- Yes
- No

Q3 Do you have a wallet for buying cryptocurrencies?

- Yes
- No
- What is a wallet?
- Prefer not to say

Q4 Do you own an NFT?

- Yes
- No

[

In case the answer was no:

Q5.1 Are you interested in buying an NFT?

- Yes
- No
- Not at present, but maybe in the future
- I don't know

]

[

In case the answer was yes:

Q5.2.1 How many NFTs have you bought?

- 1
- 1-4
- 5-20
- >20

Q5.2.2 Why did you buy an NFT? [Multiple choices possible]

- Due to the uniqueness
- Due to the technology
- To support the artist, the team, or the project
- Because of the art itself
- Because of family or friends
- Because of the utility
- Due to the investment opportunity (short-term)
- Due to the investment opportunity (long-term)

]

Q6 To what extent do you agree with the following statements on a scale from 1 (Strongly disagree) to 5 (Strongly agree)?

[Range: 1- Strongly disagree, 2- Disagree, 3- Neither agree nor disagree, 4- Agree, 5- Strongly agree]

- An NFT is a unique, irreplaceable token to me
- NFTs are expensive to me
- NFTs in the digital arts sector are not interesting to me
- NFTs are a temporary hype
- Buying an NFT is easy to me
- Other people buying NFTs have piqued my interest in trying it too
- It's easy to get information in the digital art market about new/upcoming projects and artworks to me
- Digital art is appealing to me
- An NFT purchase would be more interesting for me if you could buy it by card
- The technology on which an NFT is built is understandable to me
- The technology on which an NFT is built is disruptive
- The technology on which an NFT is built is fascinating to me
- NFTs have many more areas of application than digital art
- I am interested in buying an NFT in the digital art market
- The purchase of NFTs is associated with speculation
- Please select "5 – Strongly agree"
- NFTs are a good investment opportunity in the long term (more than one month)
- NFTs are a good way to make quick profits (less than one month)
- The NFT market is volatile

Q7 What gender do you identify with?

- Female
- Male
- Divers
- Prefer not to say

Q8 What is your age?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- Over 65
- Prefer not to say

Q9 What is your highest level of education?

- High school
- Bachelor
- Post-Graduation
- Master
- PhD
- Prefer not to say

Q10 What is your employment status?

- I am a student
- I have a part-time job
- I have a full-time job
- I am self-employed
- I am currently not employed
- I am retired
- Prefer not to say

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