

Blockchain-Powered Digital Ownership From Users' Perspectives

Nhi Dam¹, Leonhard Glomann¹, and Alexander Piazza²

¹LINC Interactionarchitects GmbH, Munich, Germany

²Hochschule Ansbach - University of Applied Sciences, Ansbach, Germany

ABSTRACT

Digital ownership has gained attraction as a prospective domain for research and development of emerging technologies in recent years. A significant number of solutions, primarily blockchain-powered systems for digital ownership, have been developed and published aiming for widespread usage. However, the approach still appears uncommon to both digital creators and consumers community. While the majority of research in this field has been on technical aspects of implementing such solutions, there is an extreme deficiency regarding users' viewpoints incorporated into the design and thus enlarging the barriers in mainstream adoption. This study picked the area of digital arts and shifted the focus to users' perspectives in blockchain-based services for digital ownership in art. By adopting a qualitative approach to learn about digital creators' behaviors and opinions, the study findings revealed various concerns about contemporary services that hinder creators' use, their actual needs and expectations in a blockchain-based system for powering digital art products. Based on the study results, three design implications were proposed to enhance the level of acceptance from the digital creator group.

Keywords: Blockchain, Digital art, Digital ownership, Non-fungible tokens

INTRODUCTION

The distribution of artworks shifted from tangible to digital has helped to increase the selling rate (McAndrew, 2019). Despite the ease of online trading, works passed from original holders to consumers have diminished the power of original holders even though they are protected through intellectual property rights (Hovenkamp, 2011). Online markets also complicated the situation as they created a "loophole" for consumers to make illicit uses of these products (Perzanowski, 2016). One of the key concerns of digital copyright management is the absence of transparency and a centralized database (O'Dair, 2017). Given that information tends to be dispersed across many databases when the work is redistributed (McConaghy, 2017), this lack of synchronized information subsequently poses significant challenges in determining the true owner's identity and authorship right over his works.

Many previous studies have highlighted the potential of blockchain technology to address challenges of digital ownership (e.g., O'Dair et al. 2017, Ismail et al. 2019). By adding art works to a blockchain network, its existence along with information about the origin and related transactions is stored

in a transparent database that can hardly be falsified. Therefore, the technology is expected to help creators to defend their rights in ways that legal and economic policies have failed to do (Chen, 2018). Recently, under the realm of ownership, blockchain is widely known to the public through the term Non-fungible Token (NFT), which is an approach to represent ownership of a unique asset in a blockchain network, the token is registered with only one owner and cannot be modified (Ethereum, 2022). Regardless of being newly introduced, NFTs have been rapidly progressing and are gathering increasing attention in various industries. Especially in the art sector, the advent of NFTs even sparked a new business model for trading unique digital artworks (Lee, 2021). Statistics also demonstrate a huge number of transactions via NFT art market, with a peak at almost 1.5 million NFT art sales per month in 2021 (NonFungible.com, 2022).

Despite its promises, there are still numerous difficulties that the technology must overcome to be really useful in the intellectual property area. One significant issue mentioned frequently in previous research is the limited legal enforceability of blockchain-based systems (e.g., Gürkaynak et al. 2018). Regardless of their advantages in authenticity and ownership, legitimate correctness from institutional practitioners is required for the system to be trustworthy (Regner, 2019). From user aspects, many issues regarding technology acceptance were investigated in previous studies such as the lack of motivation of users to switch to new services, the knowledge required for newcomers to get started, the lack of user-centered design approaches in contemporary systems (Glomann, 2019) and the absence of instant accessibility for users to interact with NFT components (Regner, 2019).

Overall, blockchain-based services in digital art still appear untapped to the main body of the artist community. While various existing issues of blockchain applications were discussed in early studies, current research findings are deficient to elicit the barriers of blockchain approach adoption and how they should be designed to reach widespread acceptance from target users in the art domain. This study attempted to investigate obstacles that impede the use of blockchain-based systems in digital art, and actual users' perspectives toward the technology. By adopting a qualitative approach, authentic insights from users were collected to formulate propositions for later design and research for future solutions. Our study outcome can be referenced as hypothetical knowledge for further investigation aiming to establish generalized design concepts for blockchain-art services' user group.

RESEARCH METHOD

With the aim to intensively analyze target users' individual context and unique perception, we employed semi-structured interviews as a qualitative technique to examine the participant's perspective on digital ownership in depth. This approach enabled an exploratory investigation of each respondents' case and revealed unexpected points through engaging conversation. The interview was conducted with six creators in the domain of visual digital art who produced imagery artworks such as illustrations, 2D/3D graphics, animated graphics. These creators are familiar with publishing their artworks

on the Internet and have a certain knowledge about blockchain-based digital ownership solutions, however, the majority of them rarely have experience with any blockchain-powered systems. While users with experience may enable a deeper exploration into pros and cons and their usage journey in contemporary services, the proportion of artists having no prior experience in decentralized solutions still far outweighs those experienced ones, therefore we believed reaching to this group was necessary to understand the factors that hinder their intention of using digital ownership solutions, allow a fresh look at the question of blockchain utility in intellectual property protection from artists' perspectives, also, we assumed that understanding the causes for discouragement would aid in the design of solutions to encourage actual users to adopt new technologies.

The interview protocol was designed to firstly learn about creators' behaviors in publishing artworks on the Internet, then to investigate their viewpoints of digital ownership and blockchain-based solutions, more specifically, the NFT area was used to represent blockchain technology since its prevalence with our participants, and finally to learn how a digital ownership solution should be designed to meet creators' expectations. During the interview, three examples of NFT platforms for artworks (foundation.app, opensea.io, showtime.io) were introduced to participants and let them explore those websites themselves. The interaction with these platforms was aimed to give participants a precise look at the real-world solutions to generate discussion about those systems.

RESEARCH FINDINGS

The analysis of the transcribed interviews with our participants has produced diverse categories containing both analogies and unique viewpoints regarding digital ownership. The findings identified based on derived categories are discussed in detail in this section.

Creators' Behavior Toward Digital Ownership: Compromise With Copyright Infringement to Publish Works

The majority of our participants considered the issues of digital copyright as certain trade-offs to broadcast their creative products. Once they published their artworks on the Internet, they accepted the fact that their authorship rights may be infringed. Some creators eventually did not consider works being used vastly without the author's awareness as an issue since they were also meant to be shared to inspire. One 25-year-old artist with fresh experience in the art field, even perceived that "being copied" also reflects the good quality of her works. Despite the general behavior of compromise, our participants all agreed not to publish the creative works that they invest much time and effort in, which actually demonstrates their concern regarding illegal use and redistributing activities in the virtual world.

Willingness to Adopt Blockchain-Based Approach to Enhance Ownership Protection

Discussing the staggering popularity of blockchain-based platforms, all participants exhibited a willingness to get on board with this emerging technology.

However, they all emphasized that it would take years for them to switch to those new services. The main reason is their belief that such a young approach needs time to address its existing issues and develop into a mature, real useful solution. Many existing concerns that prevent creators from switching to blockchain solutions now were also brought up and are discussed in-depth in the next study findings.

Creators' Concerns About Existing Solutions

Skepticism in the Ability to Address Ownership-Related Issues

While creators in our study were all aware of how NFTs may be utilized in protecting ownership of their works, they exhibited skeptical behavior toward the new approach. One participant discussed the real-life situation when a physical artwork was registered as original but it was actually a copied product from somewhere before being registered as the original; he believed that the same situation could also happen with digital artworks regardless of being powered by blockchain. While the potential of blockchain is basically about digital provenance that provides ownership certificate for an online asset that traditional methods are unable to do, the option to broadcast copies of artworks freely actually remains unchanged. Our participants perceived not much meaning in how blockchain addresses the issue since either registered works can still be a non-original one or illegal copying activities are not precluded, a digital certificate on decentralized network for them may rarely solve their true concern about author rights being infringed.

The Loss of Value in Art

A prevalent opinion among our digital creators is the loss of art value during the activities of commercializing artworks "in a NFT way". They commented that most contemporary platforms are more about investing and monetizing than embracing the genuine worth of artworks. From our artists' standpoint, artworks published on the NFT art websites were generally mediocre, those are types of works that can be made by everyone or even generated by computers. "*Only an ugly picture can be sold for \$10,000, what is the point for artists to put their effort in to make a high-quality work?*" - said by a creator. Another participant explicitly stated that it was the ownership that buyers purchased, not the artwork itself. This notion was also cited as a hindering factor to participants' adoption of such platforms since it did not align with what they pursue in art.

The quality of artworks was a significant concern to our participants as it plays a decisive role to attract both audiences and artists. Two participants proposed a solution to involve art experts in the quality assurance process of any artwork before being published. However, one creator emphasized that they must ensure the opportunity for new artists approaching the platforms, which was said to be absent from most existing solutions.

Usability Issues Perceived From Contemporary Solutions

Either from participants' prior experience on NFT websites or based on discussion during their interaction session with the given examples of NFT

services, several issues related to usability emerged. At the first look, our participants could not interpret the main functions and vision of all three examples. Most participants discussed their lack of knowledge in cryptocurrencies, digital wallets, types of blockchain networks (e.g., Bitcoin or Ethereum). The need to learn about these complicated technologies would be a large barrier for them. One artist added that the policies regarding digital rights and critical information about the transaction are currently not easy to access and comprehend. Therefore, to enter the field, our participants must invest much time and effort in researching and learning about the service.

The next usability problem is the process to push artworks on these platforms. An artist discussed, unlike established intermediaries on which she could instantly post her works, “*uploading on NFT platforms is not that easy*” as it involves many steps, registering is already complicated itself with the involvement of a crypto wallet, then it also requires a lot of unconventional information to fill in and paying fees while uploading. One participant already dropped at the step to create her profile on one of those NFT websites. In relating to this aspect, participants interpreted that many existing NFT art sites appeared to be more consumer-driven than creator-driven, in other words, it seemed easy for buyers to auction or purchase an NFT item, whereas the websites offer less obvious and attractive call-to-action for creators to upload their products.

Other Concerns: Audience Size, Environmental Impact, Ethical Issues

Along with the prevalent concerns above, participants brought up various issues that need to be considered. First, one discouraging reason raised by participants is the audience size of new platforms. While audience support is a primary motivator to publish works, our creators foresaw that they could not reach a broader audience on blockchain-based platforms compared to established intermediaries. The next issue discussed by few participants is the unsustainability of the blockchain. Given that NFT is a crypto asset built on a blockchain network that causes the need for energy consumption and puts a negative impact on the environment (Khawaja, 2021). This concern was cited as a significant barrier for two participants to use the service. Another remarkable opinion was the ethical issues triggered by the scarcity and elusiveness of NFTs. According to an artist, the technology would magnify people’s desire to own an asset exclusively, which subsequently exaggerates the egocentricity of both art creators and collectors, whereas art, from his point of view, is supposed to be shared and inspired.

Diverse Objectives and Expectations Toward a Digital Ownership Solution

Each creator in our study shared different motivations in publishing their artworks online. Considering blockchain solutions, they also expressed their distinct objectives to employ the new service. While few participants would like to monetize their artworks from the blockchain-based online trading markets, other creators would prefer to get proof of authorship for their works only instead of commercializing and publishing them globally,

likewise, one creator expressed the desire to share her artworks with the community but still be able to keep track of the transfer process to later owners without stressing on commission. Other goals include easily publishing and selling works in digital form with simplified process and minimal documentation to register ownership, increasing the output in terms of reputation and income compared to ordinary means of online publishing.

DISCUSSION & DESIGN IMPLICATIONS

Various users' concerns and expectations about blockchain-based approaches for digital ownership in visual art were revealed, the results may complement prior studies and add up diverse distinct insights that can be prospective for future research and design. Following is a list of key design considerations constructed from study results.

The Need for Educating Users

Our study respondents expressed their mistrust toward the potential of new technology, reasoning this comes mainly from their misapprehension that blockchain is meant to prevent illegal copying and usage activities. Artists should realize the importance of the visibility of artwork provenance and owning proof provided by the blockchain, as they are the major elements to protect authorship from the legal aspect (McConaghy et al. 2017, Savelyev et al. 2018). Future designs should incorporate instructional elements that allow potential users to readily discover how the system works, users' benefits, and vital information they need to obtain before getting onboard. Also, designers need to be aware to present knowledge for non-technical users since digital creators mainly come from other backgrounds than computer sciences, whereas the language used in the blockchain area is quite technical and not widely understandable to the public (Regner, 2019).

Embracing the Value of Art

Study findings reveal the importance of the art value from the creators' perspectives and how they prioritized this aspect in choosing a place to power their works. While most contemporary blockchain-based services, at least those appearing frequently on the news, discuss mainly the commercialization of digital art, many artists did not perceive monetizing as their core orientation. This suggests the need to prioritize presenting the value of art in future designs to show respect and empathy to creators for their creativity. In relation to art value, our participants expected to ensure the quality of uploaded artworks since they saw this feature is absent from many existing NFT platforms. It's worth considering to guarantee the work quality before publishing e.g., by involving experts in quality monitoring.

Enhancing Usability

Regarding user experience and user interface, our participants required firstly the comprehensibility of system features in an intuitive way. Jang et al. (2020) examined similar users' needs in his research and proposed to develop a new mental model of user interaction based on mental model of existing

applications. He specified by the example that when users are already familiar with the interaction flow of a banking application, they tend to expect and perform the same sequence of actions when encountering other banking applications. Likewise, by leveraging existing users' familiarity with online artwork platforms, designers can assist users in interpreting the actions and predicting the result with less effort. Since the new approach involves legal aspects regarding ownership such as authenticity, trading and redistributing policies, our participants urged for a clear and understandable presentation of information. They also expected a stimulating interface to encourage creators to post their artworks as many current services orient toward buyers and trading activities. Besides, a simplified process with minimized steps to upload is also critical for creators to adopt young services.

Due to artists' different objectives as discussed in research findings, the same process for work publishing applied for all creators may frustrate them with many trunks of information and redundant steps. This implies the need for a general interaction process that encompasses various users' objectives, or in another way, a separate focus on each users' goal for each solution instead of overwhelming the system to carry many target users.

FUTURE RESEARCH

Despite various insights of users' perspectives, there are still limitations in our study that open up opportunities for future research. The study focused on digital creators' viewpoints while the involvement of digital collectors and consumers is equally important to enhance acceptance for new approaches. Further analysis may shed light on this user group to complement our study from consumers' aspects. Besides, most creators in our study have no prior experience in blockchain-based services, their opinions might be influenced by presented information on media and their initial impression toward the three given examples. An investigation with experienced users is necessary to supplement our study findings. Finally, in addition to several existing shortcomings that can be addressed by better design, many concerns raised by creators cannot be resolved easily such as their worry about the loss of art value, sustainability concerns and ethical issues. To overcome these challenges, there is a need for further investigation from diverse perspectives that go beyond technical and interaction design.

CONCLUSION

By following a qualitative approach to in-depth interview, our study revealed various insights into the creators' perspectives regarding blockchain-based solutions for digital ownership in the field of visual art. Our digital creators are generally picky in choosing works to publish and have certain reluctance when it comes to their meticulous products. The study results indicated several key hindering factors for creators to adopt the technology including their mistrust of how the core issues of ownership are resolved, artists' worries about the loss of art value, the low acceptance rate of consumers, various

usability issues of contemporary platforms and other concerns about sustainability and ethics of such a development. Despite these various limitations, our creators still exhibited their willingness to adopt the new approach to power their works. This opens up space to enhance the technology for its prospective future to become a mainstream service in the art domain.

REFERENCES

- Chen, W., Xu, Z., Shi, S., Zhao, Y., Zhao, J. (2018). A Survey of Blockchain Applications in Different Domains. 17–21. 10.1145/3301403.3301407.
- Glomann, L., Schmid, M., Kitajewa, N. (2019). Improving the Blockchain User Experience - An Approach to Address Blockchain Mass Adoption Issues from a Human-Centred Perspective. 10.1007/978-3-030-20454-9_60.
- Gürkaynak, G., Yilmaz, I., Yesilaltay, B., & Bengi, B. (2018). Intellectual Property Law and Practice in the Blockchain Realm. *Law & Society: Private Law - Intellectual Property eJournal*.
- Hovenkamp, H. (2011). Post-Sale Restraints and Competitive Harm: The First Sale Doctrine in Perspective.
- Ismail, M.H., Grifell-Tatjé, E., Paz, A. (2019). Technology Assessment: Exploring Possibilities to Encounter Problems Faced by Intellectual Property through Blockchain.
- Jang, H., Han, S., Kim, J. (2020). User Perspectives on Blockchain Technology: User-Centered Evaluation and Design Strategies for DApps. *IEEE Access*. PP. 1–1. 10.1109/ACCESS.2020.3042822.
- Khawaja, A. (2021). NFT Research Essay. 10.13140/RG.2.2.24950.93761.
- Lee, L.-H., Lin, Z., Hu, R., Gong, Z., Kumar, .A., Li, T., Sijia, L., Hui, P. (2021). When Creators Meet the Metaverse: A Survey on Computational Arts. 10.13140/RG.2.2.36609.17761/2.
- McAndrew, C. (2019). The Art Market. 2019. The Art Basel and UBS Global Art Market Report|2019. Basel: Art Basel and UBS. Available online: www.artbasel.com/about/initiatives/the-art-market (accessed on 19 December 2019).
- McConaghy, M., McMullen, G., Parry, G., McConaghy, T., Holtzman, D. (2017). Visibility and digital art: Blockchain as an ownership layer on the Internet. *Strategic Change*. 26. 461–470. 10.1002/jsc.2146.
- Non-fungible tokens (NFT). ethereum.org/en/nft/. Retrieved 20.01.2022.
- NonFungible.com. 2022. *Market History*. [online] Available at: <<https://nonfungible.com/market/history>> [Accessed 19 January 2022].
- O'Dair, M., Beaven, Z. (2017). The networked record industry: How blockchain technology could transform the record industry. *Strategic Change*. 26. 471–480. 10.1002/jsc.2147.
- Perzanowski, A., Schultz, J. (2011). Copyright Exhaustion and the Personal Use Dilemma. *Minnesota law review*. 96.
- Perzanowski, A., Schultz, J. (2016). Reconciling Intellectual and Personal Property. 10.31228/osf.io/jrg2k.
- Regner, F., Schweizer, A., Urbach, N. (2019). NFTs in Practice – Non-Fungible Tokens as Core Component of a Blockchain-based Event Ticketing Application.
- Savelyev, A. (2018). Copyright in the blockchain era: Promises and challenges. *Comput. Law Secur. Rev.*, 34, 550–561.