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The Brave New Virtual Art World
The Evolution of Digital Art: NFTs and their Effects on the Art Market in 2021

by Sophie Delapaine

A thesis submitted in conformity
with the requirements for the
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Abstract Page

The first half of 2021, NFT crypto art captured both the public's attention and the art market due to the escalation of sales prices and the auction houses acceptance of cryptocurrencies. As an artform, digital art is not new. It began in the 1960s and 1970s with roots as early as the 1940s. During this evolution the lines between technology and art have intersected, often become blurred and in many cases have merged into new artforms. Even when scholars trace the origins of digital art to present day it is difficult to tell if scientists are influencing artists or artists shape technology. Crypto art comes with a unique set of benefits to both collectors and artists alike, but it also poses several new threats to the environment and the art economy. While museums, collectors and galleries are experimenting with best ways to store and display the crypto digital art, collectors and artists have the challenge to define how they would like to preserve and maintain the work whose technology is sure to be obsolete in the future.

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Introduction

The unprecedented recent sales of digital crypto art in the first half of 2021, made art experts, buyers and the public to ask what exactly digital and crypto art is, and more importantly to consider if it “real art” or technological innovation. How did these relatively unknown artists get millions for their artwork at the top auction houses and is it worth investing in or is this a bubble like the .coms of the 2000s? Art experts, dealers, writers and academics are scrambling to understand what exactly is an NFT, while artists struggle with a new ethical dilemma: are the benefits that NFTs offer worth their negative environmental impact? Experts are similarly tasked with exploring markets outside of traditional artworld expertise and norms facing challenges when displaying, curating and selling online art. Seemingly overnight new currencies and forms of handling and shipping art have been created, along with a substantial increase in first time buyers to the marketplace. Digital art ownership presents unique challenges in the areas of purchasing, displaying, curating and storing for museums, auction houses, galleries and buyers alike. In this digital age both artists and collectors are tackling old issues: how to protect their art from being duplicated, lost, stolen or deteriorating from a scientific and technological perspective.

Chapter one, ‘What is Digital Art and who are the relevant artists?’ attempts to capture the innovation and collaboration between artists and scientists from the late 1940s through the end of the millennium. It seems that artists were curious about the emerging technology and its potential as a medium, and technology-based corporations such as IBM and Bell Laboratories not only gave artists access to the technology, but also mentored and sponsored their work. While most of the world was preoccupied with

utilizing mechanical machinery and technology to defeat the enemies during World War II, after the war some of these same individuals began recrafting the machinery and its concepts for more creative enterprises which eventually led to computer graphics, animation, AI and generative art.

Chapter two explores three aspects of digital art in the new millennium by tracing how digital art evolved into crypto blockchain art, and by explaining what exactly are NFTs and how they are impacting the art market. The invention of the blockchain has created new jobs in the fields of technology, finance and art and introduced a unique vocabulary which one must learn in order to understand the concepts in these fields of study and industry. While digital art had a presence in the art market, recent sales, totaling over \$91 million at just three auctions in the first half of 2021 caused anyone watching the news, not merely the art world, to start asking what exactly are NFTs and cryptocurrencies.

Chapter three delves beneath the hype of NFTs Crypto digital art. As with every innovation, there is a learning curve, which has been transparent in this artform largely due to the technology which has allowed the world to witness its rise and provided the opportunity for social discourse both in person and on social media. NFT crypto art is experiencing growing pains: artwork has been lost, stolen and the top auction houses have mishandled the provenance chain due their inexperience. This section will highlight the positives of NFT crypto art as well as the challenges unique to the medium, which will affect everyone participating in the NFT crypto art field.

Chapter four discusses the latest innovations in art displays and how some modern museums are finding ways to incorporate digital art into their collections. Displaying

NFT art is much more complicated than hammering a nail into a wall. While the medium additionally needs a monitor and electricity for display, some of the newer artworks, such as augmented reality art and virtual reality require more equipment and technical knowledge. The issues of NFT ownership are as complex as the concepts of digital art storage. With the development of the Metaverse is in its infancy, new companies are being created to help solve and profit from these issues. Digital art also allows collectors the ability to showcase an infinite collection of art on one wall, in any size they choose: be it billboard or a 4'x6' monitor over the couch further eliminating concerns such as “I don’t have a place to put it or store it” and “It’s not the right size to go over the fireplace”.

CHAPTER ONE:

What is Digital Art and who are the relevant artists?

In the artworld, technologically based artwork is a relatively new medium and the practice has evolved to create several subcategories. The first artistic innovation fusing technology with art is called computer art. As early as the 1950s “many artists and designers were working with mechanical devices and analogue computers in a way that can be seen as a precursor to digital pioneers”.¹ American artist Ben Laposky was one of the first to experiment with analogue electric equipment and by using an oscilloscope to manipulate electronic waves that were then displayed on a florescent screen. The waves would have appeared to be undulations on the screen”² in person. From this artwork, he documented and photographed the black and white image ‘Oscillons 40’ in 1952. (Fig. 1)

Early computers were extremely large and filled up entire rooms and since their use was limited to research facilities and corporations few individuals had the access and knowledge to use them. “As a result, some of the first people to use computers creatively were computer scientists or mathematicians.”³ In



Ben Laposky, ‘Oscillon 40’, C-Type Photographic Print, Height: 20.3cm Width: 25.1cm 1952. Victoria and Albert Museum, <https://collections.vam.ac.uk/item/O187634/OSCILLON-40-PHOTOGRAPH-LAPOSKY-BEN/>

1956, IBM “demonstrated the first practical example of artificial intelligence when

¹ “A History of Computer Art.” <http://www.vam.ac.uk/content/articles/a/computer-art-history/>, accessed November 16, 2021.

² “Oscillon 40.” <https://collections.vam.ac.uk/item/O187634/oscillon-40-photograph-laposky-ben/>, accessed November 16, 2021.

³ “A History of Computer Art.” <http://www.vam.ac.uk/content/articles/a/computer-art-history/>, accessed November 16, 2021.

Arthur L. Samuel of IBM's Poughkeepsie, programmed an IBM 704 not merely to play checkers”⁴ opening the path for a new forms of art such as algorithmic and artificial intelligence that is AI or generative art.

As early as the 1960s and 1970s artists such as Jean Pierre Herbert and Freder Nade, the makers of the 1965 print, *homage a Paul Klee 13/8/65 no. 2*, wrote programs to have the computer create the artworks through “computer-guided pen plotter”⁵. Based on paper support, the artwork was signed, framed and hung on the wall as a traditional painting. The concept that a person could write a program for a computer which either instructed the computer to duplicate an artwork or the artist programmed a set of parameters for the computer to seemingly randomly make a drawing or painting was fresh and innovative to the artworld and created a new alliance between technology and artists. Companies such as Bell Labs and IBM were instrumental in fostering these technological advances in the artworld by giving artists access to computers and education. As early as 1950s, artist and filmmaker John Whitney Sr., “built his first analogue computer when he converted a World War II M-5 anti-aircraft gun director to create a complex drawing machine.”⁶ (Fig. 2)



Kevin Holmes, “Original Creators: Visionary Computer Animator John Whitney Senior,” Vice.com, June 11, 2012, 3:40pm, <https://www.vice.com/en/article/jpd4ky/original-creators-visionary-computer-animator-john-whitney-sr>, accessed November 17, 2021.

⁴ “IBM.” <https://en.wikipedia.org/wiki/IBM>

⁵ Grant Taylor, “Curating The American Algorists: Digital Art and National Identity,” *Art Curation: Challenges in the Digital Age*, August 21, 2019, <https://www.mdpi.com/2076-0752/8/3/106/htm>, accessed November 17, 2021.

⁶ Kevin Holmes, “Original Creators: Visionary Computer Animator John Whitney Senior,” Vice.com, June 11, 2012, 3:40 pm, <https://www.vice.com/en/article/jpd4ky/original-creators-visionary-computer-animator-john-whitney-sr>, accessed November 17, 2021.

Widely considered the “father of computer graphics” because he created the first computer generated art⁷, Whitney was awarded a Guggenheim Fellowship and in 1966, became the first artist-in-residence at IBM. In 1968 Whitney created *Permutations*, a 6 minutes and 20 seconds long film featuring a ballet of digital graphics set to music. Whitney’s computer art animation was limited to linear and geometric shapes, drawn predominantly in black and white. In the 1960s, an engineer in Bell Labs laser department, Billy Klüver, was approached by artist Robert Rauschenberg who “needed help in producing a wireless device and was brought in to discuss a potential collaboration.”⁸ One can often see the professional lines between artists and scientists intersecting, and in some cases artists become engineers developing technological advances and scientists becoming artists such as Klüver’s first collaboration, a kinetic sculpture that slowly destroyed itself, premiered at the gardens of the Museum of Modern Art in New York in 1960. By initiating and contributing to events such as the series of performances entitled '9 Evenings: Theatre and Engineering' organized by EAT, Experiments in Arts and Technology, in 1966, Bell Labs also promoted technology as a medium. The event was created by “30 engineers, each partnered with a different artist and instructed to produce a piece designed for a one-off performance intended to encourage an on-going partnership. As the experimental assignments began to take form, they started to attract the attention of notable names, from Claes Oldenburg to Andy Warhol”.⁹

⁷ rosapris332, “The History of Digital Art”, <https://www.timetoast.com/timelines/the-history-of-digital-art>, accessed November 17, 2021.

⁸ Caroline Christie, “How AT&T shaped Modern Art”, *Little Atoms*, July, 29, 2016, <http://littleatoms.com/how-att-shaped-modern-art>, accessed November 17, 2021.

⁹ Christie, “How.”

As computer technology evolved it became more accessible, affordable and user friendly to the public. The invention of personal computers made computers portable as well as financial affordable for some. New and smaller printers, including color ink jet printers, gave artists the opportunity to realize their printed creations in color. Advances in software, especially the launch of Illustrator and Photoshop, allowed for greater number artists access and ability to generate and manipulate images on a digital computer screen which laid the foundation for digital art.

Since the 1980s, the term digital art came to be adopted as the art made or displayed on computers, but it encompasses all forms of digital technology such as fax machines, digital cameras and cell phones. Classically trained artists whose primary work engaged with fine arts media such as David Hockney, Andy Warhol and James Faure Walker, embraced the technology and began to digitally work on computers. Andy Warhol who was also known as a photographer often utilizing Polaroid, which was a self-developing film in 60 seconds, was to have another technological art breakthrough in 1985, when he was hired by Commodore International to draw a portrait of singer Debbie Harry and used the new software ProPaint.¹⁰ A year later, David Hockney started drawing on the computer, then, continuing to experiment with the latest technology, he evolved his practice by drawing on his iPhone and iPad, and creating improvements for the new software called Brushstrokes. In 1989 Hockney used two technologies to create artwork for the San Paulo Biennale: the fax machine and black and white laser photocopier. He produced groundbreaking prints in California that were to be sent down the fax line to be printed and exhibited at the Biennale, but Brazil's telephone lines could

¹⁰ "The Warhol and the Amiga", Warhol.org, <https://www.warhol.org/exhibition/warhol-and-the-amiga>, accessed on November 17, 2021.

not receive his faxes.¹¹ Undeterred from his original vision, he completed the artwork by faxing the artwork from “one room to another and then having an assistant hand pack the sheets of paper and hand deliver them to Brazil.”¹² Despite these works by canonical artists, digital artworks were still an uncharted territory and thus they did not receive the respect, recognition and sales prices that fine art did at the time. Although Hockney gave countless interviews boasting the advantages of digital painting mentioning the ease of changing color, adding layers as well as the lack of mess and need to clean up, including the ability to draw in bed and in the dark, artists were reluctant to experiment with this new medium as it required learning how to use computer drawing software which was possibly intimidating to many. In an effort to demystify the process and techniques of digitally painting, James Faure Walker, the 1998 winner of the Golden Plotter prize at Computerkunst, Gladbeck, Germany wrote the book ‘Painting the Digital River: How an Artist Learned to Love the Computer,’¹³ in 2006, which explained how to use digital painting software, Paintbox.

In 2010, Hockney created another digital breakthrough with his Paris show, "Fresh Flowers," which included digitally created paintings displayed on twenty iPhones and twenty iPads.¹⁴ As the NPR reported, “All the gadgets are turned on 24 hours a day, and from time-to-time Hockney e-mails a new work to one of them -- a kind of artistic

¹¹ “The David Hockney Foundation, 1989,” <https://www.thedavidhockneyfoundation.org/chronology/1989>, accessed on November 17, 2021.

¹² “The David Hockney Foundation, 1989,” <https://www.thedavidhockneyfoundation.org/chronology/1989>, accessed on November 17, 2021.

¹³ Catherine Mason, “Going with the Flow”, *BCS.org*, March 3, 2014, <https://www.bcs.org/articles-opinion-and-research/going-with-the-flow/>, accessed November 17, 2021.

¹⁴ “In Paris a display from Hockney’s Pixelated Period.” Interview by Susan Stamburg, *NPR*, December 7, 2010, 12:0. Audio 6 minutes, Transcribed Interview. <https://www.npr.org/2010/12/07/131854461/in-paris-a-display-from-hockney-s-pixelated-period>, accessed November.

status update.”¹⁵ Yet artists were not exactly sure how to sell these works—as Hockney stated, “we haven’t figured out how to get paid. At the moment it doesn’t matter, but I *will* have to figure it out like everybody else.”¹⁶ Some people recognized that this new form of displaying art created a “brilliant backlighting”¹⁷ effect and the impression that the “work only lives on these gadgets”¹⁸ prompting further innovation and creative possibilities. During the Covid 19 pandemic the 83 year old Hockney created a digital sunrise sequence on the iPad, intended to be displayed on digital billboards simultaneously in New York, London, Tokyo, Los Angeles, Japan and Seoul as well as online for the month of May 2021.¹⁹ The artwork, *Remember, you cannot look at the sun or death for very long*, is a two and a half minute-long sequence which transforms from a dark scene with long shadows to a brilliant image of bright sun rays spread dramatically across the scenery. (Fig. 3) An image of hope



David Hockney, *Remember you cannot look at the sun or death for very long*. 3 minute sequence of digital artwork. Photo accessed November 19, 2021 from <https://web.archive.org/web/20140314004857/https://www.siggraph.org/artdesign/profile/whitney/whitney.html>.

during a global health and social crisis, this artwork utilized the latest technology of digital art and display technologies by granting a free immersive experience for those who can experience it in person or for those that have access to internet and computer. The work of canonical artists such as Hockney created an awareness of the artistic use of

¹⁵ Stenberg, interview.

¹⁶ Stenberg, interview.

¹⁷ Stenberg, interview.

¹⁸ Stenberg, interview.

¹⁹ Lauren Lewis, “Brightening up the World: David Hockney sunrise digital art will be broadcast simultaneously on billboards worldwide”, *Daily Mail.com.uk*, updated April 29, 2021, 10:30 EST. <https://www.dailymail.co.uk/news/article-9525541/Brightening-world-David-Hockney-sunrise-digital-art-broadcast-worldwide.html>, accessed November 17, 2021.

digital technology in the artworld and among mainstream audiences leading to further innovations and collaborations between art and technology that include a rich field of often overlapping digital art practices such as crypto art, glitch art, gen art, virtual reality art, time-based media art, social media art and augmented reality art to name only a few.

CHAPTER TWO

What exactly are NFTs and how are they affecting the art market?

Digital art raises a unique set of ownership issues from what has been considered the established way of commodifying art: its buying, selling and owning. In the past, art has been considered a tangible item that one could hold and display with a papered trail of receipts and catalogues as a means of establishing and recording ownership and provenance. Artworks created on computer devices have struggled with a secure means of conveying authenticity and ownership. Some artists who created artwork on the computer such as Hockney and Hebert would print the artwork, sign and frame it to facilitate its authentication and sale. While people might be able to view the work digitally on the internet, artists had used this method as a means of declaring the official owner of their digital creation-the individual who bought the printed and signed example of the digital work was the true owner of the work. This of course raised other issues and questions about what prevents the artist from selling more copies of a work and whether a printed work guarantees ownership of the digital rights. Artists who sold their digital artwork on floppy disc as Warhol for example, or on computer disks, thumb drives or in other formats, often faced difficulties when declaring these formats as the true original. Since the properties of digital art allow it to be exactly replicated and cloned it requires new protocols to guarantee ownership and authenticity. As a result, digital art prices have remained relatively low compared to other forms of media and contemporary art until 2019. A graph created by the Artnet Intelligence Report in fall 2021, shows the sales for Ultra-Contemporary Art at approximately \$50 million for both 2017 and 2018, rising

during the pandemic to approximately \$75 million USD. Then in the first half of 2021 “sales in the category ratcheted up to \$302.6 million—almost 300 percent above their most recent peak, in 2019.”²⁰

(Fig.4)

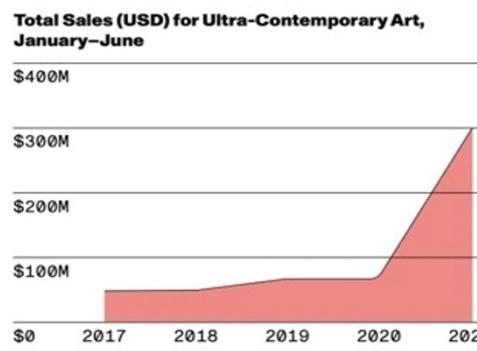


Chart from Halperin, Julia, Data Dive: “What Genre Was the Most Lucrative Midway Through The Year?,” Artnet Intelligence Report, Fall 2021, 66.

The Creation of Crypto Art

In 2014 artists started experimenting with a new technology called blockchain which was being used by some to create digital currencies. A few artists discovered that properties of the block chain allowed them to combine many forms of media such as digital art, animation and sound while incorporating contracts which could govern the artwork as well as enable a simple way to transfer title all while creating an unbroken, transparent chain of provenance. One could say that digital artwork is as indigenous to the computer and the internet as cryptocurrency and by creating artwork on the computer which is intended to be displayed on a digital screen and is easily transferred via the internet. One could speculate that cryptocurrency investors and creators saw the opportunities in the fusion of crypto currencies, which are fungible tokens, and digital art, which with these new forms of technology can be made into a NFT, non-fungible token and sold as a rare item. NFTs have offered the digital art market a means of validating and verifying a digital artwork as an original work thereby giving collectors a sense of security with the purchase of digital art. As the creator of Artnome.com, a blog which has

²⁰ Halperin, Julia, Data Dive: “What Genre Was the Most Lucrative Midway Through the Year?” *Artnet Intelligence Report The Roaring 2020s*, Fall 2021, 66, accessed October 10, 2021.

documented the evolution of crypto art, Jason Bailey wrote, “The NFT is a version that claims primacy because its identity is stabilized while the original remains impossible to identify as original.”²¹

In 2014, two artists combined their digital artwork with an ownership contract onto the blockchain which would eventually lead to the creation of a new form of art, digital crypto art. Artist Kevin McCoy created the first digital art token, NFT, *Quantum*, by combining an animated artwork and a smart contract with computer code embedded in the blockchain originally minted on Namecoin. (Fig. 5)

Then Rhea Myers' tokenized *MYSOUL* in November 2014.

The discovery, that this new technology could offer the possibility of artists procuring resale rights and specifying terms of sales in so-called ‘smart contracts’ which are embedded in the blockchain and created industries within the art world as well as a rapidly evolving vocabulary; minting, lazy minting, tokens, pointers, block chain,

Ethereum, seed phrase, PFP projects, proof of space (POFS)

and proof of work (POW). The rise of the NFTs forced auction houses around the world to adopt new forms of currency, methods of display and ownership transfer in an effort to capitalize on the emerging digital art market. While the artworld and investors wonder if the solutions that block chain and NFTs offer are a safe and secure way to purchase



Kevin McCoy, *Quantum*, NFT digital artwork, May 28, 2021, still taken from work accessed November 17, 2021, Sotheby.com, <https://www.sothbys.com/en/buy/auction/2021/natively-digital-a-curated-nft-sale-2/quantum>.

²¹ Jason Bailey, “What is CryptoArt?”, *Artnome.com*, January 19, 2018, <https://www.artnome.com/news/2018/1/14/what-is-cryptoart>, accessed on November 17, 2021.

digital art, most people are struggling to understand what exactly are NFTs and how are they made.

In 2021 Crypto Art had a record-breaking year which caused auction houses to change the way they promote crypto art and one auction house to invest in launching its own NFT minting platform. Despite a worldwide recession and the Covid 19 pandemic, 2021 digital art sales have witnessed the highest sales ever. Three digital artworks, which were created as NFTs by artists outside the fine art world and sold at the top art auction houses for more than \$4 million each generating in total \$91 million. The sale of *Everydays: The First 5,000 Days* by artist Beeple, that is Mike Winkelman, for \$69.3 million USD, is the highest sale ever for a digital crypto artwork and makes him the third highest paid living artist for a single artwork. (Fig. 6)

In the Artnet News Intelligence Report of fall 2021, they list a new art category that Artnet created in 2019, Ultra-Contemporary Art, which classifies artwork made by artists born after 1974. As Halperin wrote in her article, “The Market for Ultra-Contemporary Art at Auction Has More Than Doubled Since 2019. What’s Driving the Boom?”, “it is the fastest-growing segment of the art market by far... In the first nine months of 2021, \$462.5 million worth of art from this category was sold at auction.”²² In the NFT crypto market, teenagers are able to enter the market without extensive art pedigrees. The 12 years-old Benyamin Ahmed sold two artworks



.Beeple, *Everydays: The First 5000 Days*, 2021, digital artwork, Non-fungible token (jpg). 21,069 x 21,069 pixels (319,168,313 bytes). Minted on 16 February 2021. Photo accessed November 17, 2021 from Christies.com, <https://www.christies.com/features/Monumental-collage-by-Beeple-is-first-purely-digital-artwork-NFT-to-come-to-auction-11510-7.aspx>

²² Julia Halperin, “The Market for Ultra-Contemporary Art at Auction Has More Than Doubled Since 2019. What’s Driving the Boom?”, *Artnet*, October 28, 2001.

for approximately \$400,000 and the 18-years-old Fewocious sold for \$550,000 in 2021.

As film director, Kelcey Edwards spotlights in the “Art of Making It” it is improbable that an artist could break into a traditional gallery without an MFA from one of the top (and in most cases rather expensive) American art schools. In the film, Edwards highlights key statics from Henri Neuendorf article “It’s Official 20% of the Artists in NYC are White” based upon research conducted by Case-Leal at CUNY’s Guttman College in the fall of 2016, approximately “19% of artists working with 45 top galleries in New York City were Yale MFA graduates and 68% were male.”²³

Although Sotheby’s only had its first NFT sale this year, they have invested \$20 million in a partnership with Mojito to create a platform which will tokenize items as NFTs on their curated marketplace, Sotheby’s Metaverse, where they prompt users to create an account, and offer a digital avatar designed by artist Pak. In addition to allowing bidders to purchase the auctioned goods with select cryptocurrencies, which Christie’s and other auction houses only recently are accepting as a form of payments, the items purchased are minted on their platform have an accurate chain of title and can be viewed on the Ethereum blockchain. Presumably this will prevent omissions of previous sales which has happened earlier this year at several auction houses. In the occasion of Christie’s sale of Beeple’s, *Everydays: The First 5,000 Days* for \$69,346,250 for example, the work that was minted by Beeple on Makersplace to the buyer, Metakovan without Christie’s being anywhere listed on the blockchain as the seller.²⁴

²³ Kelcey Edwards, director of “The Art of Making it”, information gathered from text messages with author, November 14, 2021 who sites the article written by Henri Neuendorf, “It’s Official 20% of the Artists in NYC are White,” *Artnet*, June 2, 2017. <https://news.artnet.com/art-world/new-york-galleries-study-979049>, accessed on November 14, 2021.

²⁴ Ryoma Ita, works at Makersplace, information as discussed in Fanny Lakoubay’s lecture for Sotheby’s Institute of Art on Zoom platform, November 15, 2021.

Due to the pandemic, worldwide and in person experiences at galleries, museums and auctions houses came to a complete halt. As a result, the artworld had to reinvent itself in order to create a new audience and a marketplace. While some auction houses and galleries had invested in an online presence through websites and social media, online auctions and sales were not commonplace. Sotheby's solution to its delayed May 2020 New York evening sale was to create a global livestream sale, titled "Rembrandt to Richter." As Scott Reyburn wrote, "this historical mash-up was technically the first major live offering in London since the coronavirus lockdown."²⁵ Its head auctioneer, Oliver Barker was shown live, taking bids from screens across the world. The success of the 74-lot auction achieving \$363.2 million, over half the \$692 million Sotheby's raised from its Impressionist & Modern and Contemporary art sales in New York last May, broke the stigma of online sales for high value art works.²⁶ This success led other auction houses to follow online or in a hybrid format which allowed for a wider, more diverse and younger audience to enter the market and increasing the number of new bidders at the auction house sales. As it was reported, at Christie's online sale called Trespassing, "53 out of 210 bidders were completely new to Christie's."²⁷ In her article, "Data Dive," Helperin quotes Colleen Cash, vice president of Artnet Auctions, about the economic growth the company experienced during the pandemic: "Whatever lingering hesitation there was in regard to buying works online was quickly supplanted—out of necessity at

²⁵ Scott Reyburn, "Banksy and Rembrandt boast Sotheby's Sale to 192.7 Million", New York Times, updated October 14, 2021, <https://www.nytimes.com/2020/07/28/arts/design/sothebys-banksy-rembrandt.html>, accessed November 17, 2021.

²⁶ Reyburn, "Banksy".

²⁷ Shanti Escalante de Matte, "Christie's Multi-category sale, 'Trespassing' sale ends with NFTs", *Artnews*, July 6, 2021, 2:26, <https://www.artnews.com/art-news/market/trespassing-christies-auction-2-0-1234597738/>, accessed on October 15, 2021.

first—with a fervor to sustain collecting goals despite the pandemic and global uncertainty.”²⁸

These record online sales are largely due to three items: the pandemic’s in person restrictions which were imposed by governments, the emergence of digital NFT and crypto art and to the power of social media to influence potential buyers. According to Halperin, “The total amount of money generated exclusively in cyberspace—\$474 million is still up an astonishing 1,239 percent from the first half of 2019. All it took for them to prioritize e-commerce was a global pandemic that made selling art in person impossible.”²⁹ Until 2020, digital artists’ sales had never achieved such high prices. The sudden shift was in part buoyed by two of Beeple’s sales and by such PPP, or Profile Pic Project Art sales events as: CryptoPunks and 101 Bored Apes Yacht club which both have large online clubs, collectors and fan-bases, and are considered by many to be icons of crypto digital art. During the pandemic, people were “suddenly forced to spend more time at home, and treat the digital as ‘real,’”³⁰ which elevated the participation in social media platforms and at online auctions for buyers, auction houses, art dealers and artists. As Artnet’s 2021 Fall Intelligence Report noted “So far, Sotheby’s has retained its lead as the top seller on the web, with \$326.5 million in total sales by midyear; Christie’s comes in second, with \$139.8 million (buoyed by the \$69.3 million sale of Beeple’s *Everydays: The First 5,000 Days*). Phillips ranks a distant third, with \$7.7 million in exclusively digital sales.”³¹

²⁸ Halperin, Julia, Data Dive: “How Much Art Sold in Online Only Sales in the First Half of the Year?,” In *Artnet Intelligence Report The Roaring 2020s*, Fall 2021, 63.

²⁹ Halperin, Julia, Data Dive: “What Genre Was the Most Lucrative Midway Through The Year?,” *Artnet Intelligence Report*, Fall 2021, 66.

³⁰ Escalante de Matte, “Christie’s”.

³¹ Halperin, Julia, Data Dive: “How Much Art Sold in Online Only Sales in the First Half of the Year?,” *Artnet Intelligence Report The Roaring 2020s*, Fall 2021, 63.

While Beeple may not be highly regarded in the art community as an artist, before these sales he had a huge following on social media: on Instagram alone, he had two million followers prior to these record sales.³² In January 2021, Metapurse, a crypto fund, announced “that it had spent more than \$2.2m on buying the complete set of 20 first edition works of art in the Beeple’s *Everydays: The 2020 Collection* via a Nifty Gateway auction.”³³ This purchase and the announcement was followed by a marketing campaign to promote Metapurse and Metakovan, launched with a series of press releases and podcasts aimed at the tech market.³⁴ Then, “Metakovan, the Singapore-based pseudonymous and otherwise anonymous founder and financer of the crypto fund Metapurse”³⁵ now identified as Vignesh Sundaresan, bought *Everydays: The First 5000 Days*, the first NFT to be sold at auction, for \$69.3 million USD, making it the third highest auction price for a living artist. It seems that this purchase would give Metakovan access to Beeple’s over 2 million followers and due to its unusually high price for a relatively unknown artist, it would generate an enormous amount of press and exposure, especially because Christie’s was allowing payment in cryptocurrency. What makes these sales significant is the resulting boom to the digital crypto art market: Beeple

³² Jesse Damiani, “From Crypto To Christie’s: How Beeple Put Digital Art On The Map—And Then Catalyzed Its Market,” *Forbes Magazine*, February 16, 2021, <https://www.forbes.com/sites/jessedamiani/2021/02/16/from-crypto-to-christies-how-beeple-put-digital-art-on-the-map-and-then-catalyzed-its-market/?sh=c4e93ef6a067>, accessed on November 17, 2021.

³³ Anna Brady with additional reporting by Helen Stoilas, “Revealed: Metakovan, pseudonymous founder of ‘crypto-exclusive fund’ Metapurse, is the buyer of Beeple’s \$69.3m NFT”, *Art Newpaper*, April 12, 2021, <https://www.theartnewspaper.com/2021/03/12/revealed-metakovan-pseudonymous-founder-of-crypto-exclusive-fund-metapurse-is-the-buyer-of-beeples-dollar693m-nft>, accessed on November 17, 2021.

³⁴ Hack Crypto, “What is Metapurse & B@)? Exclusive interview with Metakovan”, Youtube Video interview between Hack Crypto and Metakovan, February 2, 2021, 42 minute interview, <https://www.youtube.com/watch?v=2Atnp4A6zI>, link to press release

³⁵ Brady, “Revealed”.

and Crypto NFT Art made headlines worldwide and are seen by many to have broken through the glass ceiling which previously stigmatized digital artworks.

Soon thereafter Metakovan used this exposure to reveal his own identity and promote his project, a virtual museum solely dedicated to Beeple's 20 artworks, B20. Metakovan then launched a campaign to fractionalize the ownership, introducing collective ownership, of the B20 museum by tokenizing it with B20 tokens, which "started out at under \$2 a pop."³⁶ During the week of the Christie's March 9, 2021 sale, the price the price of B20 tokens soared to an all-time high of \$29.78 per token.³⁷ One could say that Metakovan manipulated the auction prices in order to gain worldwide exposure for himself and his company as well as to commodify the artwork to Beeple's fans, and art and technology speculators, by creating a new strategy to flip artwork. The Metapurse website emphasizes its new role as NFT "producer" who is giving exposure to projects and promoting production studio services.³⁸ The sale created a rare opportunity for individuals to purchase parts of the first virtual museum for a few dollars, where the portfolio of 20 artworks was created by the same artist who sold the first NFT crypto art for \$69.3 million would look to be a bargain.

However, the sales for the B20 tokens have waned, and the price per token is down to \$1.38. The museum is built and housed in the virtual world on virtual real-estate called Decentraland of which Metapurse owns approximately 50% of the company.³⁹ B20

³⁶ Waldemar Januszczak, "Here's How Beeple's 'Everydays' NFT Became the Third Most Expensive Artwork Ever Sold", *Robb Report*, July 5, 2021, https://www.yahoo.com/lifestyle/beeples-everydays-nft-became-third-210000685.html?fr=yhssrp_catchall, accessed on November 17, 2021.

³⁷ Value of most digital currencies on coinbase.com, accessed on November 1, 2021.

³⁸ Metapurse Fund, "Productions House," <https://www.metapurse.fund/studio.html>, accessed December 1, 2021.

³⁹ Zoup, "Metapurse Fund, Portfolio Evaluation," Nonfungible.com, March 3, 2021, <https://nonfungible.com/blog/metapurse-fund-portfolio-valuation#!>, accessed November 17, 2021.

token were given to the all the artists and creators who were involved and account for 66% of the B20 tokens and 8% to private sales. Tokens sold to individuals not directly involved, those at arm's length distance, were 26% as of November 16, 2021. The total amount realized from the public and private sales was \$1.3 million. Metapurse spent over \$2.5 million on the production of the B20; which included the art, the virtual build out and launching event.⁴⁰ The official website for the B20 shows a balance of 6 million tokens left which were never sold and do not appear to still be for sale. Walters states that tokens for the B20 are only available for purchase on secondary markets, like Uniswap.org. Lastly, on the official website for the B20, the museum also allows for a buyout should an investor, with terms listed on the site, decide to purchase the museum, for \$12million or 58,000,000 DAI noting that the profits would be paid out proportionately.⁴¹

Profile Pic Project art

Another type of digital art, which is unique to the digital art market and has propelled the art prices for digital crypto art due to its popularity in digital communities is Profile Pic Project art known as PPP art. The first of these was called Rare Pepes, a series of digital frog drawings based on the meme of a frog created by cartoonist Matt Furie. In September 2016 Rare Pepes released the first user-issued trading cards based on the Counterparty blockchain, arguably the first of crypto art community. The artist known as @nola1978 created the first Rare Pepe by pairing a Rare Pepe image with a counterparty

⁴⁰ Twobadour in conversation with author on Google Meet, October 27, 2021 and Brooke Walter confirmed these Token sales percentages and amount realized via email on November 16, 2021.

⁴¹ "B20 Tokenomics," outlines the ownership and buyout stipulations, <https://b20.metapurse.fund/>, accessed November 17, 2021.

asset. A Telegram chat group was soon created as a result of others wanting to pair their Rare Pepes with counterparty assets. Joe Looney, creator of the Rare Pepe Wallet, used a technology called Counterparty to make it possible to buy and sell Rare Pepes on the Decentralized Exchange (or the DEX) by incorporating the data on the Bitcoin blockchain and allowing artists to create any kind of digital token. (Fig. 7) What makes this art collection unique is that anyone can make and sell its content, there is no sales commission involved, interested parties just need to follow a set of rules. According to the guidelines, Pepes need to be 400x500 pixels, have something to do with Pepe, be less than 1.5 mb and they need to be reviewed by the Rare Pepe Foundation. Looney made two other innovations which were crucial to the Rare Pepe success: he created a way for the artist to add a music or a video game to a Rare Pepe and he has created the Rare Pepe gift card, which allows the receiver of the card, to get the “gift” without having to trade in bitcoin. Those that are non-technical or do not have an account can simply go to the site and type in the code on the card.



Joe Looney, Homer Pepe NFT, digital art, 2016, still accessed on November 17, 2021 from newsbtc.com, <https://www.newsbtc.com/analysis/eth=rar-e-homer-simpson-pepe-nft-sells-for-312k/>.

The next evolution of the Profile Pic Project was in 2017 with the creation of CryptoKitties by artists Guile Gasper and CryptoPunks by software developers John Watkinson and Matt Hall from Larva Labs. The CryptoPunks were unique collectible characters, 10,000 in total, with proof of ownership stored on the Ethereum blockchain. Although 9,000 CryptoPunks were given away for free to anyone with a digital wallet and 1,000 went to the developers, they are now considered rare as they are linked to early

NFT history with a single punk, #3100, selling for as much as 4.2KΞ (\$7.58M), in March 11, 2021.⁴² (Fig. 8) There are many online clubs and groups for the owners of the works, some even divided into Punks with headbands or Aliens serving “as a symbol of status, ownership and pride.”⁴³ The Bored Ape Yacht Club, a recently created Profile Pic Project art series by Yuga Labs launched at the end of April, 2021, sold out in several days for a total of \$24.3 million. Larva Labs, the creators of the CryptoPunks, created another more evolved Profile Pic Project series, the Meebits, which allows the buyers of these 3-D artworks to use them as avatars in the Metaverse as game characters for browsing in the B20 gallery. The recent sale of a bundle of 101 Bored Apes Yacht club for 24.4 million, at Sotheby’s, “Ape In! “ September 2021 sale demonstrates the public’s attention and enthusiasm for this digital genre. By holding this NFT, one gains access into exclusive messaging platforms like Discord and Telegram for the very active community of Bored Apes Yacht Club collectors. “The winning bidder received an additional perk: six “mutant serums,” which can be used to generate mutant varieties of an Ape within the lot.”⁴⁴ In my recent interview with two owners of *Bored Apes*, the owners stated that ownership makes them feel cool: they like the “bragging rights and belonging to the owners only online club” as well as being able to purchase merchandising featuring



Larva Labs, CryptoPunk #3100, NFT Digital Art, 2017. Photo accessed on November 17, 2021 from Larvalabs.com, <https://www.larvalabs.com/cryptopunks/details/3100>.

⁴² “CryptoPunks Largest Sales,” Larva Labs, https://www.larvalabs.com/cryptopunks?utm_source=nonfungible, accessed on November 17, 2021.

⁴³ Srujana MN, “Explained: What are CryptoPunks and everything you need to know?, ” Cryptobullsclub.com, September 3, 2021 <https://cryptobullsclub.com/cryptopunks/>, accessed on November 15, 2021.

⁴⁴ Shanti Escalante De Mattei, “Sotheby’s Brings in \$26 Million with Bored Ape NFT Bundle,” *Artnews*, September 9, 2021, <https://www.artnews.com/art-news/market/sothebys-bored-ape-nft-sale-1234603344/>, accessed on November 17, 2021.

Bored Ape Yacht Club exclusively available to confirmed owners.⁴⁵ (Fig.

9) Even the Visa Corporation, the first financial services corporation to settle transactions using crypto, bought a CryptoPunk recognizing it has become a “cultural icon for the crypto community.”⁴⁶

In 2012, Dada.nyc, created a platform on which people from all over the world with computer access can digitally collaborate, or as they put it, “can speak to each other through their drawings”⁴⁷. They also offer an online marketplace for sales, creating a democratizing opportunity for those in countries without an accessible art market, NFTs or crypto art. Doing so they effectively removed the middleman, excluded art dealers, and facilitated sales through terms set forth in their smart contracts. In an article by Judy Mam, one of DADA’s cofounders discussed the now famous 2017 ERC20 *Creeps & Weirdos* project, as being “inspired by the *Rare Pepes* and the *Cryptopunks*, which had just been launched a couple of months before”.⁴⁸ The Halloween themed project consisted of 108 limited edition drawings made by artists all over the world which has a total of 16,600 digital editions with 5 different levels of scarcity.⁴⁹ Mam states that, “Matt and John from Larva Labs generously allowed us to modify the *Cryptopunks* smart contract. We did this by coding royalties into the smart contracts on-chain for the first time in NFT history,⁵⁰ specifically enabling 30 artists mostly from Latin America to make digital art on Ethereum. Mam stated in our interview



Photo of Bored Ape Yacht Club owner wearing hoodie taken November 4, 2021 by Sophie Delaplaine.

⁴⁵Two gentlemen wearing “Ape Hoodies” in discussions with the author on the street in front of dreamverse event, Pier 5, November 4, 2021.

⁴⁶Ryan Browne, ”Visa jumps into the NFT craze, buying a ‘CryptoPunk’ for \$150,000”, *CNBC.com*, August 23, 2021, 10:11 am, <https://www.cnbc.com/2021/08/23/visa-buys-cryptopunk-nft-for-150000.html>.

⁴⁷Judy Mam in telephone discussion with author on November 10, 2021.

⁴⁸Judy Mam, “A Brief History of the Creeps and Weirdos,” *NFTSWTF*, September 21, 2021. <https://nfts.wtf/a-brief-history-of-the-creeps-weirdos/>, accessed on November 1, 2021.

⁴⁹Judy Mam in telephone discussion with author on November 10, 2021.

⁵⁰Mam, “A Brief”.

that she believes this project to be the first to include royalties for the artists, with 70% going to the individual artist and 30% going to the collective which includes artists, developers and computer programmers. DADA has 20 active individuals making decisions for the collective: some more active in the artistic aspects and some more involved with business and technological. For the resale rights of these first contracts, the profits would be divided as: collectors received 60%, artist 30% and DADA 10%. In 2019, DADA rereleased this series as ERC721 token on OpenSea and modified the royalty, now 100% of the payments goes to DADA to be distributed among members of the collective.

Although it is technically the same artwork, *Creeps & Weirdos* has become “two editions with two historic contracts smart contracts”.⁵¹ Dada has created several collections since then, but they have not tokenized them yet. Mam says they are launching a new platform in January, 2022 which will have a timeline and “aims, to value the history, community and evolution of Dada.nyc.”⁵² In an article for Dada.art published on September 21, 2021, Mam reported that Metapurse “purchased a complete set of the historic 2017 Creeps & Weirdos NFT Collection for 500 ETH.”⁵³ The set was showcased in several different types of art displays at Dreamverse event November 4, 2021, one of them curated by Mam. (Fig. 10).



Artist/Curator Judy Mam in front of the 2017 Creeps & Weirdos which she curated for Dreamverse, November 4, 2021. Photo taken by Sophie Delaplaine.

⁵¹ “Two Vintage Editions,” Dada.nyc, <https://creeps.dada.nyc/>, accessed November 17, 2021.

⁵² Judy Mam in telephone discussion with author on November 10, 2021.

⁵³ Mam, “A Brief”.

Crypto Digital Art Terms

The quickly evolving field of crypto digital art has created its own vocabulary which must be defined in order to be able to grasp its concept. Digital currency often called bitcoin, which now has names such as Ethereum and Bitcoin, “is a system of digital currency not associated with any government or institution. Somewhat confusingly, the word “bitcoin” (lowercase “b”) is also the name of the currency itself.”⁵⁴ While traditional centralized currencies are “minted” when governments print new dollars or bills, cryptocurrencies such as Bitcoin and Ethereum are created through a process called “mining”, which is “accomplished with computers and software rather than dynamite and shovels. For a new block of transactions to be added to the blockchain, a burdensome math problem must be solved, and the “miner” who solves the problem first is rewarded with brand new bitcoins”.⁵⁵ Once created, digital money is exchanged, for purchasing and selling, much as centralized monies except that it is transacted digitally, and its transaction recorded on the platform on which it was created under a pseudonym. Bitcoins or tokens are fungible tokens, they are identical and interchangeable: one Ethereum is the same or equal to another Ethereum. However, there are many types of bitcoins and they are not fungible just because they are a cryptocurrency. Currently, there are over 13,506 named cryptocurrencies,⁵⁶ and if sellers are accepting cryptocurrency, they need to list the specific type of cryptocurrency that

⁵⁴ Tess Rinearson, “Bitcoin Explained with Emoji, Part 1: Making Money,” Medium.com, July 21, 2017, <https://medium.com/s/story/making-money-530d2bb2b8f7>, accessed on October 15, 2021.

⁵⁵ Rinearson, “Bitcoin.”

⁵⁶ Connor Sephton, “How Many Cryptocurrencies Are There?,” Currency.com, November 2, 2021, <https://currency.com/how-many-cryptocurrencies-are-there>. Accessed November 14, 2021.

they accept. If the buyer has a different form of cryptocurrency, they would need to buy or exchange their cryptocurrency for the vendor's accepted cryptocurrency at a currency exchange such as cryptoexchange.com and coinbase.com. While the platforms and digital wallets for purchasing goods allow for pseudonyms, some companies selling cryptocurrencies such as Gemini and Coinbase.com, require that buyers verify their legal identity through photo identification and social security number.

An NFT, or non-fungible token, is unique and not interchangeable. They are created when a digital file such as a JPEG or MP4 “is minted, on a platform such as Rarible or Mintable. The computational process of minting costs money and energy used, referred to as “gas,” that registers it on the blockchain. A work of crypto art is more than a digital artwork, it also incorporates the record on the blockchain that encodes its provenance, so the artwork can be traced back to the original artist as well as to owners. Artists and subsequent sellers might want to add to the ledger a smart contract that defines the conditions of its transfer, add a royalty for the artist when the work is resold, or add a percentage of the future proceeds to a particular charity. One can add to the block chain, but not one person or entity can edit or delete items from the blockchain. As Brian Droitcour wrote, “While it’s possible to store media in this record too, it’s prohibitively expensive, and so the on-chain token usually just points to the file’s address on an off-chain storage site, such as the distributed server known as the Inter Planetary File System.”⁵⁷ The Inter Planetary File System keeps the files stored on a set of decentralized chain of computers all over the world which cannot be compromised. The actual artwork is not stored on the blockchain but summoned by the Inter Planetary File

⁵⁷ Brian Droitcour, “How to Look at NFTs,” *Art in America*, March 4, 2021, 12:55 pm, <https://www.artnews.com/art-in-america/features/nft-art-1234585590/>, accessed November 17, 2021.

System based on the owner's crypto wallet, an encrypted wallet for keeping digital items such as currency or NFT artwork, or in the virtual world, known generally as the Metaverse. This process takes place through the use of a seed recovery phrase which refers to a specific set of words which act as a password, unique to each wallet, to open a digital wallet allowing access to stored items such as cryptocurrency or artwork. Lazy minting is a term for artwork which the artist has not yet minted but intends to so once the artwork is sold. The advantages of an artwork being sold on the blockchain is that the provenance is documented and stored on an immutable ledger system, which is easy to trace. Unlike paper receipts which can be lost, damaged or can never exist, crypto art allows anyone to verify the provenance by virtually visiting the platform it was created on and viewing the ledgers of ownership. A problem for such digital ownership and wallets, is that owners can forget or die without recording their password. Without the digital password means the artwork and its ownership are conceivable gone forever, not simply left in a vault or warehouse to be discovered at a later date. There are many blockchains, and as various brands of cell phone chargers are not interchangeable, some block chains do not technologically communicate with each other either. If an artwork is minted on a blockchain, it does not necessarily mean that it can be transferred to another blockchain. Ethereum and Bitcoin use a consensus protocol called POW, proof of work, which consumes a lot of energy as each transaction must be completely verified by miners. The more power a miner has access to, the more money they can make as they need energy to mine versus the validator theory in proof of stake, POS. Ethereum and other companies are looking to transition to proof of stake which uses less energy because the "file" or items on the block chain are confirmed to be accurate by a

consensus of randomly chosen validators. In order to become a validator, one agrees to stake their Ethereum to activate the ability to create new blocks. As of November 14, 2021 one would need to stake 32 ETH to become a validator.⁵⁸

⁵⁸“How to Stake,” Ethereum, <https://ethereum.org/en/eth2/staking/>, accessed November, 14, 2021

CHAPTER THREE

What lies beneath the hype?

NFTs and crypto digital art

In the NFT crypto digital art trade there are many positives for owners, dealers and auction houses and artists alike. There is no shipping or customs; digital artwork can be instantaneously transported and for people selling online there is usually less commission split than with traditional galleries: 15% versus 50%. Transfer of ownership as well as of payments can be made immediately. Since sales are recorded and available for everyone to see, artists can verify the sales prices. The platform also allows for artists to know who the current owners are, thereby allowing them the possibility of interacting directly with the current owner as well as the ability to conceivably approach collectors to “loan” work for museum exhibitions and retrospectives. Smart contracts allow for artist to receive royalties for the resales of their work, which gives them two items they did not have until now: the ability to receive passive income and should the artwork greatly appreciate in monetary value, realizing some of the financial gains previously afforded only to the seller, and the opportunity to customize the contract. For the artwork *Replicator*, artist Mad Dog Jones was able to stipulate that the original artwork and its subsequent generations (future artwork generated by a computer program the artist has



Mad Dog Jones, *Replicator*, Multigenerational NFT digital artwork, Minted April 11, 2021, 4:01pm, still photo accessed on November 17, 2021 from [Maddogjones.com](https://maddogjones.com), <https://maddogjones.com/prints/196609>.

created), “children” and “grandchildren,” must be kept together and not be resold as individual art pieces.⁵⁹ (Fig. 11)

How secure is artwork on the blockchain?

While some artists and collectors are exuberant about the possibilities and potential of NFTs in the digital art market, others are not enthralled with NFTs. When asked what he thought about NFTs on the podcast hosted by Waldemar Januszczak, and Bendor ‘Bendy’ Grosvenor, “*Waldy and Bendy’s Adventures in Art*,” David Hockney commented, “Things can get lost in the computer, can’t they? And they will be, in the future, lost in the computer, even when the cloud gets going. There’s going to be so much on it, how will you find it?”⁶⁰ In fact one of the forerunners in this field, Ham van den Dorpel, known for *Event Listeners* (2015), a limited-edition screensaver, which was the first museum purchase in Bitcoin, by the Austrian Museum of Applied Arts/Contemporary Art,⁶¹ did lose access to his art. He writes, “Although the token provenance information that ascribe stored on the immutable Bitcoin blockchain will always remain there, in practice, we have lost access to it, as their web interface to retrieve it was discontinued.”⁶² Nevertheless, he continued to sell on the block chain and in 2018, minted Ethereum tokens for the editions that had been sold and supplied them

⁵⁹ “Replicator,” Phillips Auction house, <https://www.phillips.com/mdj>, Accessed November 17, 2021.

⁶⁰Ekin Genc, “Highest Valued Living Painter David Hockney: NFTs are for ‘Crooks and Swindlers,’ ” April 4, 2021, <https://decrypt.co/63917/artist-of-worlds-most-expensive-painting-nfts-are-for-crooks-and-swindlers>, November 17, 2021.

⁶¹Hannah Ghorashi, “MAK Vienna Becomes First Museum to Use Bitcoin to Acquire Art, a Harm van den Dorpel,” *Artnews*, April 24, 2015, <https://www.artnews.com/art-news/market/mak-vienna-becomes-first-museum-to-acquire-art-using-bitcoin-a-harm-van-den-dorpel-3995/>, accessed November 17, 2021.

⁶² Harm van den Dorpel, “Tokenizing Sustainability”, Harm.work, March, 2021, <https://harm.work/news/tokenizing-sustainability>, accessed November 17, 2021.

with an ERC721 smart contract. He asked the current owners of these works for their Ethereum wallet address and essentially reissued them tokens for the editions they already owned, which in effect tokenized some works editions on two blockchains at once. This is just one of the examples of the fallibility of transferring works on the blockchain.

While there are many incentives for the art world to trade in NFT and digital currencies, this system or trade is far from established and secure. Smart contracts have yet to be tested in court and will most likely be unenforceable in many countries such as China and Africa. If a collector loses their passwords for their digital wallet, there is no way presently to reset the password, the money and artwork is lost. Artworks can and have been “stolen” or minted before the artist or collector has had the opportunity to do so themselves, which would cause complications in provenance. Major auction houses have changed their guarantees for digital art vs real world, brick and mortar art. They will not guarantee the work, the artist or that the link to the work will work, unlike the brick and mortar works which have a five-year authenticity guarantee in the established auction houses such as Sotheby’s and Christie’s. To further complicate matters, digital currencies are volatile and there is no way to assure that they will retain their value or be worth anything in the future. In theory, blockchains are secure, yet computers and computer systems have been known to be compromised, so there is no guarantee that someone, be a group or a quantum computer, will not find a way to hack into the systems, steal the money and goods, or crash the systems. The World Economic Forum explains how quantum computers can break current standards of encryption as follows: “The sheer calculating ability of a sufficiently powerful and error-corrected quantum computer

means that public-key cryptography is ‘destined to fail’ and would put the technology used to protect many of today’s fundamental digital systems and activities at risk.”⁶³

Unlike traditional art, there is no way to insure NFT crypto art from damage, loss or theft. Anticipating such complications a company called Club NFT offers customers the ability to download the art on to site as a backup while another company created by Aleeza Howitt offers users the opportunity to digitally knock off or copies of NFT crypto digital artwork.⁶⁴ Just recently Jason Bailey, creator of the blog Artnome which details the general history and definitions of blockchain, posted on LinkedIn, that the platform HEN, short for Hic et Nunc, was “discontinued” leaving all of their NFTs without a platform.⁶⁵ In a blog on Club NFT, the CTO of Club NFT, Chris King has made an agreement to save these works by making a deal with Infuria by “picking up the tab ourselves to make sure the off-chain assets (the art itself) associated with your collection will not disappear.”⁶⁶ King further notes that he himself lost many NFT artworks in 2017 and 2018 when marketplaces went out of business.

Dada.nyc also experienced technical complications with the 2017 *Creeps & Weirdos* during the pandemic. They had taken down the link which allowed people to purchase the 2017 *C & W* for several reasons namely that there had been advancements in the technology and they wanted to modify the “smart contracts”. Amiss all of the PPP art

⁶³ Daily Hodl Staff, “Will This Quantum Computing Breakthrough Save Bitcoin and Cryptocurrency?”, *The Daily Hodl*, August 9, 2020, <https://dailyhodl.com/2020/08/09/will-this-quantum-computing-breakthrough-save-bitcoin-and-cryptocurrency/>, accessed November 17, 2021

⁶⁴ The sites for these companies are: <https://www.clubnft.com/solution>, <https://www.knockoff.lol/#/>.

⁶⁵ Jason Bailey, LinkedIn, November, 13, 2021. https://www.linkedin.com/posts/jason-bailey-0a899b6_clubnft-agrees-to-pay-to-pin-all-nft-content-activity-6865043969093472256-XdPZ/, accessed November 14, 2021.

⁶⁶ Chris King, “ClubNFT Agrees to Pay to Pin All NFT Content From Discontinued Hic et Nunc Marketplace,” Blog on Clubnft.com, <https://www.clubnft.com/blog/clubnft-agrees-to-pay-to-pin-all-nft-content-from-discontinued-hic-et-nunc-marketplace>, accessed November 14, 2021.

hype during the pandemic, someone had found a worm hole possible via a time machine and technologically unearthed a link that allow them to purchase works at the lower prices which used the previous contracts. As a result of this incident these works could not be traded on the secondary market.⁶⁷

Obsolete Technology

One of the big questions for digital art and its artists, buyers and museums is what to do when the technology in which the art is created, displayed and or stored becomes obsolete. Should it be transferred to another media using the latest technology? Will the artwork still be considered an original? Although commercial floppy disks were the height of technology in 1971,⁶⁸ they were later replaced by compact discs, then in the 2000s, by DVDs, and now by flash-based thumb drives and virtual storage, the cloud. Further complicating the matter is when a technological artwork is stored digitally, as in the case of a floppy disk, the artwork can lose bits of data over time and the original artwork will deteriorate. There are experts who can transfer the data to newer technologies and in some cases repair data loss, but the question remains would this be considered digital art restoration? Digital art creates a whole new set of problems and questions such as, how can artists start to address the issues of what constitutes an original digital art piece created on a computer to be displayed on computers, tablets, websites, and TV monitors? Should artists start anticipating these specific issues and address them in smart contracts which can be attached to the original piece of art on

⁶⁷ Judy Mam in telephone discussion with author on November 10, 2021.

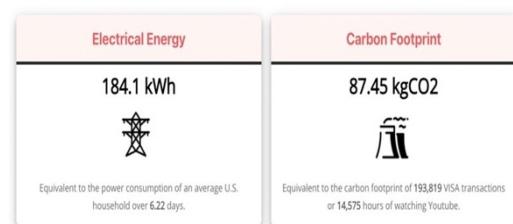
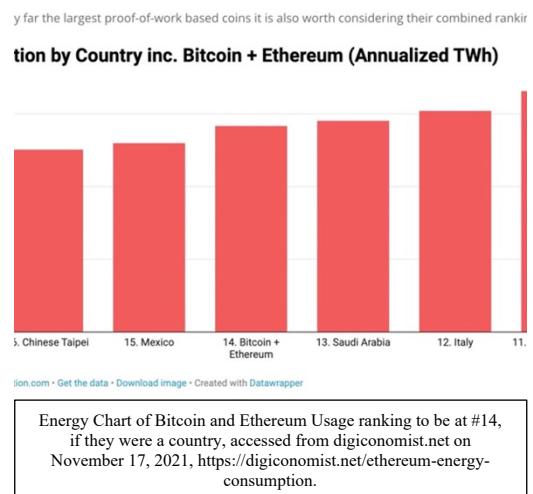
⁶⁸ “Floppy disk,” Wikipedia.org, https://en.wikipedia.org/wiki/Floppy_disk, accessed November 17, 2021.

Ethereum, NFTs or as a manifesto on the artist's personal website? If the artist dies, who will maintain these sites?

The Environmental Costs of NFTs

Despite some of the advantages, some artists refuse to participate in creating and maintaining NFTs, much like digital currencies, citing that the environmental costs of NFTs and Ethereum are too great. For example, *Replicator*, created by Mad Dog Jones on April 4, 2021 as a digital art work and was sold as an NFT on the OpenSea platform, and on Ethereum, where a single transaction is "the equivalent to the power consumption of an average US household over 4.61 day."⁶⁹ The total number of transactions on Ethereum "are consuming enough energy to power a country, if it were a nation it would be ranked number forty seven in energy consumption."⁷⁰ (Fig 12,13) While "the Ethereum website promises to complete the transition to proof-of-stake in 2022, which will signal the end of energy-intensive mining"⁷¹

many ask how can we be sure when this will actually happen. Artists and technological innovators are working on alternatives. Artist Ham van den Dorpel was recently given a grant by the" Interchain Foundation for the development of an "application-specific"



Energy Chart shows energy consumed and carbon footprint of Ethereum, accessed from digiconomist.net on November 17, 2021, <https://digiconomist.net/ethereum-energy-consumption>.

⁶⁹"Ethereum Energy Consumption Index," Digiconomist.net, <https://digiconomist.net/ethereum-energy-consumption>, accessed November 17, 2021.

⁷⁰Ibid.

⁷¹ Van den Dorpel, "Tokenizing."

proof-of-stake blockchain. Where Ethereum hosts many unrelated applications all on one blockchain (competing for scarce resources), an application-specific blockchain consists of only one application, fine-tuned to its unique requirements. Van den Dorpel will be developing such a blockchain using the Cosmos SDK. The long-term vision of the Cosmos community includes connecting many of these isolated blockchains, forming an “Internet of blockchains”.⁷² One might ask if these platforms are looking to other obvious solutions such as utilizing renewable energy sources.

⁷² Ibid.

CHAPTER FOUR

How digital art is being displayed, stored & commodified?

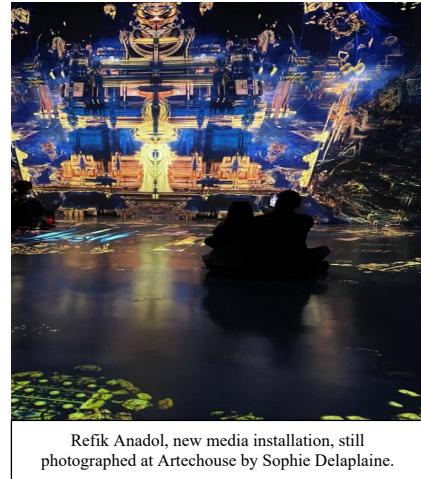
How is NFT crypto art and digital art transforming the role of the gallery?

In the past few years, companies have found a new way to monetize art: they are selling tickets to art experiences, a new form of art spectacle. Mega galleries such as Pace Gallery have heavily invested in gallery spaces like Superblue, selling the art experience thereby replacing the sale of an art object. Tickets are timed and small groups are allowed in, creating an intimate and personal experience with the art, rather than being in a crowded museum or art fair. In certain rooms guests are asked to turn off their phones and not to speak so that one's attention is focused on the experience of being in the presence of the art and the sound without distractions. In another room, there is a mirrored maze with a digital interactive component. Here, play and interaction with the technology and each other is encouraged. At Artechouse, a venue staged in New York City, Washington DC and in Miami, tickets are also limited and timed, giving the patron space and time to absorb the experience. Friendly guides nearby answer questions and demonstrate how to utilize the technology to create or experience the art for the inquisitive. Here too there is a series of rooms, with unique hi-tech artworks. As one enters the New York show, Geometric Properties, one sees a life-sized digitized bar based upon Edward Hoppers, Nighthawks of 1942 created by the Noiland Collective. (Fig.14) One can stand next to the digitized version of the iconic lonely customer at the bar and feel as if one could order a drink from the bartender. When one gets near the screen, about 3 feet, a colored aura is



Noiland Collective, NHKS Bar Illusion 4220, 2020, new media installation still from installation at Artechouse photograph by Sophie Delapaine.

created incorporating viewers into the artwork. In the big room, there are pillows on the ground for guests to recline and absorb the surrounding digital art show. (Fig.15) Similarly, in the *Van Gogh: The Immersive Experience*, which is traveling to 22 cities worldwide, with two locations in London, the tickets are timed and while the venue is large, the amount of people is limited so that one can walk around freely and at their own pace. Viewers start with a gallery experience of Van Gogh's paintings, which were mechanically reproduced, then there is a timed show on a loop where the artwork becomes animated with music. There are multiple images being played all around the room giving the viewer the feeling that one is inside a moving paintings. For the Dallas show, the website boasts more than 15,000 square feet of space filled with screens. Views can sit, stand, freely walk around or lie down to enjoy the multimedia experience. (Fig. 16) As guests exit, there is a room filled with sunflowers and infinite mirrors ideal for taking selfies. All these spaces allow the viewers to enjoy the experience for approximately ninety minutes and proceed at their own pace or go back to revisit sections. While sold out shows suggests their popularity with audiences, the art world might start to question if these venues are offering viewers' a more authentic and democratizing experience than the private invitation only wine and cheese opening night gallery parties or the VIP collector's previews at Art Basel.



Refik Anadol, new media installation, still photographed at Artehouse by Sophie Delapaine.



Van Gogh: The Immersive Experience, 2021
Photo taken by Sophie Delapaine

How is digital art being displayed in art fairs?

When in person art fairs, such as SpringBreak and the Armory resumed in New York City in September, 2021, they had surprising little digital art to offer. By contrast, art fairs like Cadaf, the Contemporary and Digital Art Fair, presented digital art in innovative formats in both Paris and New York City. During 2020-2021, when the world was in lock down and in-person art fairs were closed, some such as Art Basel offered online viewing rooms with trepidation as to how they would be received by customers and galleries as the traditional art world had been resistant to being transparent with pricing. Cadaf, elevated the traditional in-person and OVR digital viewing to a curated outdoor pop-up digital art fair. In the summer 2021, they collaborated with businesses in Paris by having artists submit work for sale relating to a specific location in Paris. QR codes were posted on a nearby business or location and anyone passing by could scan the code to view the piece in the location for added immersion. Currently, they have created a similar format for Digital Art Month in New York City, which also hosted the NFT.NYC conference on Times Square in early November. Half a block away from the entrance to the Artechouse exhibit, Cadaf strategically placed a midsized sandwich board with a QR code on the sidewalk. When the QR code was scanned *Rabbit the Ken* by artist kenxxooo popped up. (Fig. 17) Fans and collectors can visit their website to see the specific locations for the curated collections and pictures of the augmented reality and video art. When I spoke to Elena Zavelev, co-founder of Cadaf about their next art fair which will be held during Art Basel, Miami she said that she was



Kenxxooo, Rabbit the Ken, AR effect, 2021, still taken by Sophie Delapaine.

scouting locations to display art on monitors which would be highly visible at heavily trafficked sites such as hotel lobbies.⁷³

Another new development for digital art fair display was held recently at the NFT Crypto Art Fair coordinated by NFT magazine on Times Square in the early afternoon of November 2, 2021. Approximately 150 spectators were treated to an immersive digital art show being displayed on a large digital billboard in the center of Times Square which offered the viewers the ultimate NYC experience, the smell of hotdogs and pretzels from nearby vendors, a gentleman stripped to his Fruit of the Loom underwear and cowboy boots singing a song about NFTs (Fig. 18), the sound of friends cheering artists and the ability for fans to shake hands and meet the artists.(Fig. 19) At one point in the hour-long show, I was asked by a lady, Neomi, who was live streaming the show to her nephew, King in Nigeria, an artist whose works were chosen to be displayed, to take a picture and send it to her so as to commemorate his moment of fame.



Singing Cowboy at NFT.NYC Times Square, photographed by Sophie Delapaine.



NFT Crypto Art Fair coordinated by NFT magazine in Times Square November 2, 2021 from 1-2pm, photographed by Sophie Delapaine.

How are digital art collectors and museums displaying their art in the physical world?

⁷³ Elena Zavelev in discussion with author on Zoom.com on August 10, 2021.

While digital frames have been around for over a decade and offered customers the opportunity to display their digital photo or art albums, they were usually small, no larger than 8 by 10 inches. The digital frame market has come a long way and frames are now as large as billboards. Two of the luxury brand digital frame companies that collectors are using to display their rare collections are Lago and Blackdove. Blackdove offers digital frames in sizes from 49 to 98 inches, or as large as the Marriott Marquis display on Times Square, which is 50 by 8 feet LED screen. (Fig 20) The least expensive home option is just under \$3,000 with multiple choices



Stan Adard, *Curious Blue*, streaming digital video, 2017
breathing pictures series, photo still taken at Marriott Marquis
Times Square New York City, by Sophie Delapaine.

of colored edges. Blackdove's co-owner, Dan Miksell disclosed to me in an interview that they had made three billboard size screens for the "The One" in a 100,000 square foot home in Bel Aire and one of the most expensive homes in the country.⁷⁴ Blackdove also offers a streaming membership where subscribers for \$1,200 a month, and hotels and businesses \$6,000 a month can gain access to a digital artwork from a library consisting of 1,500 artworks. Both Lagos and Blackdove offer a curated site for customers to purchase NFT crypto art and a secure platform for storage which can be accessed by digital phone or tablet as well. For collectors and artists looking for more affordable options, there are Samsung QLED televisions and Infinite Objects. Infinite Objects makes a digital frame which preloads artwork into a clear acrylic, the most popular option with pricing starting at \$89. (Fig. 21) The downside is that they do not offer sound

⁷⁴ Dan Miksell in telephone interviews with author on September 12, 2021 and October 27, 2021.

and if unplugged the battery only lasts an hour. However, the frame can hold up to 24 hours of content and if someone bought an NFT and wanted to share the image with friends as a gift, the owner could have a copy of the artwork framed while retaining the work in their wallet or wherever they store it. The company will facilitate the process of verifying ownership, getting the artist's permission, which may include a small fee for the artist, and they also offer a royalty payout for registered artists. Also, if the owner sells an NFT, they could keep its framed image. Samsung QLED televisions offers several unique features for owners to display digital photos and art with prices ranging from \$450 to \$4,300. Unlike other major television brands, Samsung is additionally selling digital art, annual memberships to rent digital art, and framing options to enhance the design element of the art display. With artists pushing the technology boundaries, digital framing companies will need to keep pace with the ever-evolving technological support this type of art demands. While many of the more expensive "classic" works such as Cryptopunk's, 336 px square (pixels are the colored digital dots that make up the image) and Bored Apes Yacht Club's, 631px square pieces do not require sound, newer PPP like the Gutter Cat Gang's NFTs are 4000 px square.⁷⁵ Lagos is ready for the next level in digital display and has a new immersive interactive frame for which they are taking preorders.



Lori Field & Harry Field, *Batgirl Pastoral*, Digital Artwork 2021, framed by Infinite Objects. Photo taken at SpringBreak art show, September 2021 by Sophie Delaplaine.

⁷⁵ Jim Dee,"At What Pixel Dimensions Are Most Generative NFT Art Projects Built?," *Medium.com*, August 10, 2021, <https://medium.com/web-design-web-developer-magazine/at-what-pixel-dimensions-are-most-generative-nft-art-projects-built-9344d3998ac0>, accessed November 17, 2021.

Metakovan recently promoted his Metapurse NFT art collection by selling tickets to the Dreamverse event in New York City on November 4, 2021, which was a live art show and concert, the event also featured the presentation of Beeple's, *Everyday's: The First 5,000 Days* at night. This was the first live event for Metapurse in their attempt to position themselves as a promoter and producer of artists in Hollywood movie studio style. Dreamverse was strategically launched on the heels of the NFT.NYC convention which ended on November 3, 2021. It presumably intended to capture the attention of professionals and investors and functioned as an after party for the crypto community that flew in from all over the world to attend. Dreamverse tickets are considered collectable digital art as they are designed by artist Alotta Money and originally issued in black and white, they only become 'colored' when scanned at the event. In an attempt to further promote the NFT concept and technology, tickets could only be purchased digitally with the YellowHeart app at price points ranging from daytime entry to the gallery at \$30 to \$2,500 for the VIP music concert tickets.

The daytime gallery event held in New York City's Terminal 5 hosted 3 floors of 161 digital artworks, most of which were owned by MetaPurse. They were displayed on more than 50 screens not including those on stage.⁷⁶ There were 5 virtual reality booths which included a curated gallery of *Creeps and Weirdos* by Angie Taylor, *Glitter & Sparkle Hands* by Violet Forrest, and two augmented reality booths. As one entered the building under an arched tunnel of



Attendees Elsa Akesson, Margherita Magnino and Gloria Cavaciuti from Sotheby's Institute of Art. Photo taken by Sophie Delaplaine.

⁷⁶ The Curator screens were Panasonic 4K, the Intersection screens were Samsung and the Scaffolding screens were a mix of LG, Samsung, and Sony, as confirmed by Brooke Walters via email November, 2021.

LED tubular lights display (Fig. 22), to the left found a collective of twelve artists from DADA traditionally painting a large colorful artwork on four adjoined, life-size panels. (Fig. 23) To the right was stand selling T-shirts and caps sporting NFT slogans, looking much a merchandising booth at a concert. (Fig. 24) Just beyond this space, there was a digital display by 40 artists from the Genesis Collection of TIMEpieces, including 37 unique artworks which were turned into 4,676 NFT artworks in September 2021. For some of these artists it was their first venture in the NFT crypto art world. (Fig. 25)

Displayed on monitors throughout the venue, were digital artworks with QR codes. (Fig. 26) The intention was for the QR codes to take viewers to the artworks NFT platform, however there was a glitch so the Dreamverse team chose instead to us the QR codes to take viewers to the artist's Twitter profiles."The main conversation in the NFT art spaces happens on twitter," said Brooke Walter, Operations Manager of Metapurse.⁷⁷ The second floor also featured the *2017 Creeps and Weirdos* in a curated display by Judy Mam, Dada.nyc co-creator. The project consists of 108 limited editions drawings made by artists all over the world. The collection has a total of 16,600 digital editions with 5 different levels of scarcity, this is significant, since Dada.nyc the first company to modify the



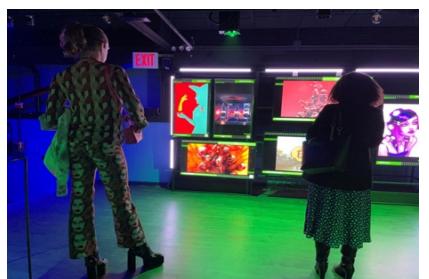
Artists from DADA create a four-panel artwork. Photo taken by Sophie Delaplaine.



Merchandise booth at Dreamverse. Photo taken by Sophie Delaplaine.



"The Future of Business," Cover of TIME Magazine, May 10, 2021, which featured artwork by Beeple and stories about the NFT commerce. Photo taken by Sophie Delaplaine.



NFT Crypto art displayed with QR codes linking to the artist's twitter account. Photo by Sophie Delaplaine.

⁷⁷ Brooke Walter interview with author on Google meet on November 10, 2021.

smart contract and the *Creeps and Weirdos* resale rights provide royalties fees which go to the collective.

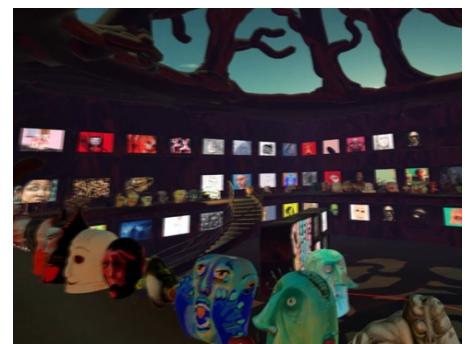
One the third floor of Dreamverse, guests could experience the VR artworks with the aid of hands-on experts, who put the headset on viewers and taught them how to “walk” through the virtual galleries. (Fig. 27) The VR artwork *Glitter Sparkle Hands* in an edition of 5 NFTs, allows the viewer, to interact virtually with the work through hand gestures creating glittering, sparkling hands. (Fig. 28) For the *VR Creeps and Weirdos Museum*, its curator, Angie Taylor, displayed the complete set of 108 works on the walls of a virtual gallery, and then added animated 3D models of the *Creeps & Weirdos* created by Marko with the Mostermash app. (Fig. 29) Taylor placed the animated 3D models along the railings for the stairs and hallways, stating that the display responded to Judy Mam’s comments about always falling off the stairs in virtual reality. Taylor’s display is part of a larger VR artwork that she has been working on for over two years called *Scattered Mind*. She intends to donate the *Creeps and Weirdos Virtual Reality Experience* to Dada.⁷⁸ During the day, Mike Winkleman, aka Beeple, participated in a Meet & Greet event where the line went around the galleries with people waiting for a chance to shake his hand and snap a selfie.



Viewers experiencing the *Creeps and Weirdos VR Museum*, created by Angie Taylor. Photo taken by Mary Healy.



Still from *VR Glitter Sparkle Hands* by Violet Forest provided by artist.



Creeps and Weirdos VR Museum, created by Angie Taylor. Still provided by Angie Taylor.

⁷⁸ Angie Taylor & Marko interview as a series of emails with author from November 10-12, 2021.

At night the lights were darkened which added to the immersive experience. The bright lights of the LEDs on the display walls made it difficult to see the artwork on the monitors, but it gave the venue an atmosphere of a hip nightclub and made the framework for the displays seem like artworks in themselves. For the concert event, only the artwork beneath the stage, called Intersection (Fig.30) was removed for the audience to listen, dance, and watch a series of DJs (Maachew, PLS&TY, Stretch Armstrong & Eli Escobar and Alesso) perform on stage.



"Intersection display." Photo taken by Sophie Delaplaine.

At approximately 11:30 the Beeple's *Everydays: The First 5,000 Days* was introduced on a billboard sized screen on stage as digital short movie. Walter explained that the video called *Metasouk* was designed to demonstrate the virtual building which Holly13, an architecture firm, is building in Decentraland where people will be able to digitally view *Everydays: The First 5000 Days* by virtually flying up and down for close viewing. (Fig. 31)

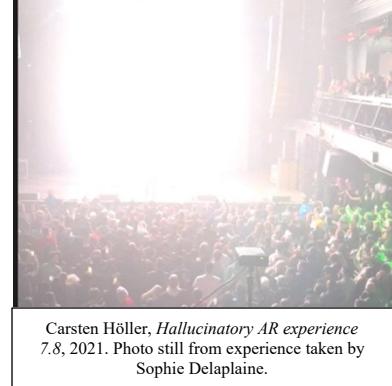
During the evening event artist Carsten Höller attempted to create a strobing light display to give the audience a psychedelic experience, *hallucinatory AR experience 7.8*, however only a few were able to download the app and no one appeared to be having the intended experience. (Fig.32)



Holly 13, *Metasouk*. Still photo from the video taken by Sophie Delaplaine.

Afterwards, the screen was filled with the now familiar image of colored squared boxes of the *Everydays: The First 5000*, which panned, tilted and zoomed in and out, occasionally landing on a close up picture from the work. The audience cheered as Beeple, Metakoven and Twobador appeared on stage and said a few

words about NFTs and art. Although the event seemed more like a combination of an art happening and a trendy night club show, the predominantly young audience seemed to be enthusiastic about the opportunity to engage in an in-person digital art experience until 1 am. The event as a whole felt validating for the NFT art community, and I could feel the excitement and the energy throughout space.⁷⁹



Carsten Höller, *Hallucinatory AR experience* 7.8, 2021. Photo still from experience taken by Sophie Delaplaine.

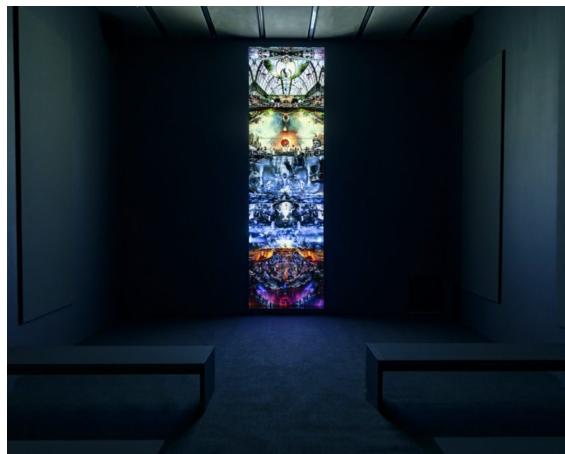
Auction houses such as Sotheby's have been publicly criticized for their poor display and promotion of digital artwork. When Christie's New York offered nine CryptoPunks in May 2021, sold for \$16.9 million USD, they displayed the works as small photos which appeared to be stuck to a wall prompting one fan to tweet about "How Christie's Fucked up the Punks Auction".⁸⁰ In June 2021, Bonham's advertised a screening at their New Bond Street Headquarters in London, for their auction: Crypto OG's (Original Gangster) The Pioneers of NFT Art. When I went to preview the collection, I had to wait to find a person to take me upstairs to a locked, dark, small room. The works were not even being displayed so that potential buyers could see them with other collections on display. As the salesperson, Frederick Millar, turned on the lights and the two medium size televisions mounted on rolling stands, he apologized for having no one on staff who knew anything about digital art to answer my questions, emphasizing that he was an expert in impressionist and modern art. Traditional auction houses such as

⁷⁹ Sophie Delaplaine, "How Does the World's Biggest Art Collector Show Off His Art Collection? He Throws a Party and calls it 'Dreamverse,'" *Made in Bed*, November 24, 2021, <https://www.madeinbed.co.uk/art-business-markets/rbckw6pbnse0o5f9bfhqgm5yjdvmx1>, accessed November 24, 2021.

⁸⁰ @gmoneyNFT, "How Christie's Fucked Up the Punks Auction," Twitter, May 11, 2021, 11:43 PM, <https://twitter.com/gmoneyNFT/status/139232452682700390>, accessed November 17, 2021.

Sotheby's and Christie's are learning from their public mistakes and in the second half of 2021 has begun to address the specific needs of digital art display and sales. Dan Miksell confirmed in our recent interview, that Christie's invested in Blackdove monitors in July 2021 to give collectors the "optimal digital art experience".⁸¹ In September 2021, Sotheby's partnered with Mojito to build a platform which will "mint" NFT crypto digital artwork, thereby creating a proper chain or transference, an obstacle in 2021 for many auction houses.

Similarly, museums are finding innovative ways to incorporate digital art into their collections and improve their existing displays. Although "Of the roughly 55,000 museums worldwide, Cuseum founder Brendan Ciecko estimates that fewer than 1,000 have leveraged either augmented or virtual reality to date"⁸² some in person museums have found ways to augment their digital collections without having to payout large sums of money. In my recent interview with Dan Miksell from Blackdove, Miksell confirmed that that PAMM, the Perez Art Museum in Miami, had recently expanded their collection to include digital art works. They had purchased four monitors from Blackdove which are currently configured as one large installation measuring approximately 9 by 4 feet, to display Marco Brambilla's, *Heaven's Gate*, an 8 minute and 45 second work on the multiple screens (Fig. 33),



Marco Brambilla's, *Heaven's Gate*, an 8 minute and 45 second work on multiple screens, installation approximately 9'x4', Perez Museum, Miami, FL. Photo taken from whitewalls.art, accessed November 17, 2021, <https://whitewalls.art/art/marco-brambilla-decontextualizes-hollywood-icons-at-pamm>.

⁸¹ Dan Miksell in telephone interviews with author on September 12, 2021 and October 27, 2021.

⁸² Tim Schneider, "The Art World's Technological Revolution is Coming," *Artnet Intelligence Report The Roaring 2020s*, Fall 2021, 55, accessed November 17, 2021.

The artwork, available for purchase for over “six figures”, is on loan from the artist to the museum and being stored on the Blackdove platform. On October 30, 2021 a posting on behalf of the Homer Science Group to the Museum Junction Open Forum of American Alliance of Museums, was offering a donation of NFT digital, animations with sound to ten museums to be transferred through a digital wallet. The “limited-edition piece of Paleo Art by the artist, Fabio Pastori, who has worked closely with the paleontologist, Jack Horner, to create a 're-imagined and re-imaged' vision of 10 different dinosaurs”⁸³ was being offered to raise funds for research and education funds for the Horner Science Group Paleontology Research and Education Foundation. By creating the artwork as NFTs and donating them to museums, the foundation has created the opportunity to raise awareness of both the NFTs’ excessive energy consumption and the CO2 emissions debate by allowing the foundation to “raise the awareness of how the science process works through immersive dinosaur experiences.”⁸⁴ While some say that there are not enough digital art being represented in museums, it is clear that the worldwide headlines and speculation in the NFT crypto digital art has prompted many contemporary art museums to rethink and expand their digital art displays.

In the artworld and for the general public, art display has been as essential to the experience of artwork as the artwork itself. One might argue that digital artwork does not allow for the authentic viewing of a single masterpiece such Leonardo DaVinci’s *Mona*

⁸³ Audrey O’Connell. Community Forum Posting, American Alliance of Museums, October 30, 2021. <https://community.aam-us.org/communities/community-home/digestviewer/viewthread?MessageKey=c3a1b383-dbce-46bd-a7de-9795c398a169&CommunityKey=d34b2dfb-4151-4629-a59a-553d0ae428d9&tab=digestviewer#bm7cccc03-4a5a-4339-899e-0f64119c9e8d>, accessed November 11, 2021.

⁸⁴ Ibid.

Lisa, because digital works can be exactly duplicated and used as screen savers on smartphones. In his essay, “The Work of Art in the Age of Mechanical Reproduction” Walter Benjamin wrote about the masse production of artwork and that an original artwork contained a “uniqueness, that is, its aura”,⁸⁵ a magical or supernatural force that a viewer could experience in its presence. However, the further one is removed from the original artwork, the artwork loses its uniqueness, and the experience is lost. This concept brings into question, what is authenticity? Benjamin wrote that masse production of artwork, leaves the viewer without a fully realized experience of the artwork, thus its impact of a copy or mass-produced piece is diminished. One might say that digital art is masse production as many artists such as Mad Dog Jones have posted their work, while being owned by a collector, on a website available for everyone with access to a computer to view on the internet. Others might argue that digital artwork is designed to be viewed or experienced on a computer or digital monitor, and that the medium allows for a true democratization of art. One does not have to own or go to the Louvre to feel the aura effect of an original artwork. I feel that the experiences of awe and aura can be equally felt by viewing digital artwork on a cellphone or when in a digital art gallery such as New York City’s Bitforms and Postmasters. Often friends will show me a digital work they admire or have purchased on a smart phone. At the great reveal of *Everydays: The First 5,000* at Dreamverse, people were audibly gasping and cheering the artwork and I could feel the presence of the aura. The grandness of the presentations, a large stage featuring billboard sized screen display, music, drinks, coupled with the shared

⁸⁵ Walter Benjamin and Michael W. Jennings, "The Work of Art in the Age of its Technological Reproducibility [First Version]." *Grey Room* 39, no. 39 (2010): 11-38.

experience of a first time viewing of \$69.3m work certainly felt authentic and memorable.

Conclusion

It seems throughout history whenever there are scientific breakthroughs in a field, artists have experimented with the technology and though their ingenuity, creativity, curiosity and out-of-the box thinking pushed the technology to further heights. This is most certainly the case with digital art and the NFTs. The science of blockchain has offered mankind a solution to government-controlled currencies and the complicated issues in the artworld of authenticity and provenance. It also provides artists the opportunity to dictate pricing and through smart contracts to potentially receive passive income through the secondary marketplace. In addition to bringing people together through Profile Pic Projects art and collaborative creation on such platforms as Dada, it also allows for artists to participate in shows and events by sending their work instantaneously without the expenses of shipping, customs, taxes, etc... Throughout the years, I have encountered many friends trying to get paintings authenticated only to be rejected by an “art expert” in charge of the catalogue raisonne who did not even examine the work. While science does offer the ability to authentic artworks, and it was a deciding tool to establish authenticity of some paintings for the Rembrandt Project, it is expensive and not usually helpful for recent works such as Andy Warhol’s. In my negotiations with several painters from Europe, they have been afraid to send their works to the US, stating that in the past gallery owners have not paid them for their work and they could not afford to go to the US to take them to court to get them back. Such costly experiences have prevented them from working with US galleries. Galleries, such as the auction house I work for, are afraid to pay for the artwork upfront citing that if the artwork is

damaged in the transport, they will be out the money. For the moment blockchain alleviates these and countless other issues allowing for prompt payment, transportation, provenance and ultimate transparency. For those concerned with the environmental impact from abundant use of energy blockchain currently requires, I feel it is important for societies to keep raising these issues, as they have in other fields such as electric automobiles, and to keep pressing and pushing companies such as Ethereum for better solutions and further innovations as with complacency comes stagnation. Digital technology has only recently been created and the concept of art on the blockchain is not even a decade old. There are many art collectors who are choosing not to invest in NFT crypto art even though they admire and enjoy the work because they still prefer the tangibility of traditional art stating that they feel uncertain of technology and its ability to keep the work safe. To this, I say there is certainty in life's uncertainty, just ask a dinosaur.

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