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DEVELOPMENT OF CRYPTOART AS A MODERN METHOD OF MONETIZATION OF ART AND COPYRIGHT PROTECTION

In modern society, *digital art*, once so new and refreshing, has lost its value not only to artists, who now live by it, but even for the other, “not creative”, part of the world, which has got completely used to it. Devaluation of digital art began a few years ago, basing on the accessibility of art objects, the possibility of its unlimited multiplication and reproduction. The main quantity of art platforms offer protection from *copyright abuse* only via the use of watermarks and restricting free access to artists’ social media pages [1]. Those precautions do not stop frauds from illegal distribution of artworks. In terms of solving emerging problems with intellectual rights violation based on the already existing technology of cryptocurrency, cryptoart has been created. That is why cryptoart has been chosen as the ***object of this research***.

The purpose of this paper is to investigate the development of cryptoart as a modern method of monetization of fine art and copyright protection.

Cryptoart is rare digital artworks, sometimes described as digital trading cards or "rares", associated with unique and provably rare tokens that exist on the *blockchain*. The concept is based on the idea of digital scarcity, which allows you to buy, sell, and trade digital goods as if they were physical goods. This system works due to the fact that, like Bitcoins and other cryptocurrency, cryptoart exist in limited quantity [5].

It works by adding a unique and indelible signature to a digital file, called “tokenizing” or “minting” it on the blockchain [7]. A blockchain collects information together in groups, also known as blocks, that hold sets of information.

Blocks have certain storage capacities and, when filled, are chained onto the previously filled block, forming a chain of data [6]. Technology distributes information across many computers instead of a central one. The non-fungible token (aka NFT), the unit of data on a blockchain, represents a value of scarcity for the associated artwork. The token holder can enjoy that value or sell or gift it, but only those who hold the token can "own" that particular blockchain-signed artwork, even as unsigned copies are free to circulate. The artist retains copyright.

When the artist uploads the artwork to the digital gallery SuperRare, a transaction is created in the Ethereum blockchain. The transaction essentially moves a SuperRare token associated with the artwork to the crypto wallet of the artist that created the piece. Notably, the transaction is digitally signed by the artist to prove the authenticity of the work. The artwork is then uploaded on the InterPlanetaryFile System or IPFS for short. You can retrieve the very same image on IPFS using its hash. When the artwork is sold, another transaction moves the token to the wallet of the buyer, and a value of cryptocurrency equal to 0.6 Ether (the currency of Ethereum blockchain) is moved to the wallet of the seller [3].

Other than getting profit, joining cryptoart movement offers access to a large commune, that gathers all sorts of artists all over the world, lets them communicate and meet constantly in virtual meeting spaces (the Metaverse). The space is wide open to anyone willing to jump in, learn, and try out new things.

Selling work on a blockchain on the other hand can be a technically challenging task. For this reason, many platforms and websites have emerged, aiming to make this process as seamless and easy as possible for artists. Unfortunately, currently, many of these websites are based on the Ethereum blockchain, which is very inefficient and ecologically costly by design [4].

The carbon footprint of NFT throughout the history of cryptoart is estimated as 163,486 $KgCO_2$ with an energy usage of 263,538 kWh [8]. It is equivalent to: an EU resident's electricity consumption for 77 years; flying for 1.5 thousand hours; driving

838 thousand Km (petrol); using a laptop for 2.5 thousand years; boiling a kettle 3.5 million times.

The Cryptoart market is a new way for artists to distribute digital works to collectors, it provides secure ownership, artist commission on secondary market sales, and a thriving marketplace, with platforms emerging quickly. It is a vibrant and welcoming community, a place to discuss the works with collectors. It has the potential to become a sustainable practice for artists. That is until you understand the magnitude of the environmental impacts of the current blockchain and there is a lack of clear information on the ecological impact of different approaches to NFTs. However, hopefully, as more artists migrate to these emerging waters, this can encourage platforms, developers, investors, and collectors, to bridge to develop more ecologically friendly and transparent platforms [2].

Conclusions. Towards the end of our research, we arrived at the conclusion that the cryptoart is a new way for artists to present digital artworks to the world, ensuring the protection of copyrights and safety of intellectual property. The vast community of fellow cryptoartists is ready to help with any smallest request and guide novices through the first steps into a new era. But the cost of such an immense "moonshot" towards the future is high – ecological problem emerges. NFTs are partially responsible for massive planet-heating CO_2 emissions generated by the cryptocurrencies used to buy and sell them. The main course the cryptoart movement is taking now – is searching for more sustainable ways to distribute and sell artworks using NFT technology.

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