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Nina SOLOTCHI.....	2122
STUDIUL ASUPRA UNIFORMEI ȘCOLARE TRANSFORMABILĂ: O SOLUȚIE VESTIMENTARĂ ADAPTABILĂ PENTRU EDUCAȚIA MODERNĂ	2126
Vitalia BÎTA	2126
ИННОВАЦИОННЫЕ РЕШЕНИЯ В РАЗРАБОТКЕ УНИФОРМЫ ДЛЯ ЗАКЛЮЧЕННЫХ.....	2130
Роман ПАПУШИИ.....	2130
CODUL ZERO WASTE. ABORDĂRI ECOLOGICE ȘI SUSTENABILE ÎN DESIGN VESTIMENTAR	2135
Eugen REABENCHI	2135
TRANSFORMATIONAL RECONSTRUCTION AS A MODERN APPROACH IN APPAREL DESIGN.....	2140
Olehoslav SERBIN ^{1*} , Kalina PASHKEVICH ²	2140
CREATING A COLLECTION OF CLOTHES USING ARTIFICIAL INTELLIGENCE.....	2142
Anastasiia MOVCHANIUK ¹ , Viktoriia MYTSA ^{2*}	2142
DEVELOPMENT OF CLOTHING MODELS IN THE CONTEXT OF CIRCULAR FASHION.....	2147
Diana HASANOVA.....	2147
CULTURAL-AESTHETIC COMPONENT OF COLOR IN MODERN CLOTHING DESIGN PROJECTS	2149
Yuliana PYLYPENKO ¹ , Pavlo CHABAN ²	2149
EXPLORING CHILDREN'S PICTURE BOOK DESIGN: ANALYSIS OF COMPOSITION AND COLOR APPLICATION.....	2151
Yifeng LIN ^{1,2*} , Olena GERASYMENKO ¹	2151
USAGE OF ADDITIVE TECHNOLOGIES FOR ORTHOPEDIC FOOTWEAR MANUFACTURING	2155
Dariia KAPTIUROVA* Liliia CHERTENKO, Olexander BONDAR.....	2155
THE IMPACT OF NFT TECHNOLOGY ON THE DIGITAL ART AND DESIGN MARKET	2159
Sofiiia HTYRSAI ^{1*} , Olena SLITYUK ²	2159
REASERCHING THE POSSIBILITIES OF USING INNOVATIVE TECHNOLOGIES IN THE DESIGN OF PROTECTIVE MASKS	2163
Volodymyr KUZMENKO ¹ , Yana MAMCHENKO ¹ , Yuliia VESELA ²	2163
HISTORIOGRAPHICAL ASPECTS OF MEN'S CLOTHING SHAPING.....	2166
Yana MAMCHENKO ¹ , Ivan FROLOV ² , Liliia NAVOLSKA ²	2166
INNOVATIVE MATERIALS AND TECHNOLOGIES IN THE DESIGN OF FASHION PRODUCTS	2169
Tetiana REMENIEVA ^{1*} , Tetiana LUTSKER ² , Tetiana STRUMINSKA ²	2169
AVANT-GARDE AND FUTURISM IN THE ART AND DESIGN OF CONTEMPORARY COSTUME	2172
Anna KOSTOCHKA ^{1*} , Nataliia Kizayeva ² , Victoriia VYSOTSKA ³	2172

THE IMPACT OF NFT TECHNOLOGY ON THE DIGITAL ART AND DESIGN MARKET

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Abstract. *The technology of non-fungible tokens (NFTs) is revolutionizing the digital art market, creating new opportunities for artists and collectors. Its impact lies in increasing accessibility and ownership of art, as well as establishing new standards for the "artist-consumer" interaction. However, new challenges arise, such as competition and copyright issues. Research suggests strategies for supporting and developing digital art, while also highlighting the need to increase user awareness of risks and ethical aspects. The positive impact of NFTs is evident in the growth of sales volumes, but there is a need to improve security and legal norms. The issue of blockchain energy efficiency, not NFTs, requires urgent resolution, including a transition to more environmentally friendly alternatives. Additionally, the article addresses ecological issues associated with crypto mining and proposes alternative solutions aimed at reducing environmental impact.*

Keywords: *blockchain, copyright, digital art, ecological issues, energy efficiency.*

Introduction

In the world of contemporary art, digital technologies play an increasingly prominent role in shaping the art landscape, from altering the creative process to changing the ways in which art interacts with its audience. One of the most well-known and discussed innovations in this context is the technology of non-fungible tokens (NFTs), which enables the creation and exchange of unique digital assets on the blockchain. Over the past few years, the NFT market has experienced rapid growth, attracting the attention of both artists and investors, and opening up new opportunities for interaction between creators and audiences. However, along with these opportunities, come challenges associated with this technology.

In this study, our aim is to examine the impact of NFT technology on the digital art market and identify key problems that arise in its use. We will not only consider the positive aspects of NFT implementation but also thoroughly analyze the negative consequences and challenges faced by contemporary artists, collectors, and developers of digital art. Our goal is not only to understand the current state of development in this field but also to explore potential constructive strategies for overcoming the identified problems and ensuring the sustainable development of digital art in the context of NFT technology.

Methodology

The methodology involved a literature review, as well as data and market trend analysis, to ensure a comprehensive understanding of the research topic and to develop recommendations for further research and practical applications in the field of NFTs and digital art.

Results and discussion

The implementation of NFT technology not only transforms the digital art market but also expands its boundaries, creating new opportunities for artists and collectors. Through the use of blockchain for effective transaction organization, NFTs establish a transparent and secure platform that encourages the advancement of digital art. One of the significant aspects of this revolution is

the increased accessibility of art to a wide audience. NFT technology enables artists from all over the world to showcase their works directly in digital format, bypassing traditional distribution channels.

In this new context, key aspects such as uniqueness, ownership, authenticity, and non-replicability provide artists with remarkable opportunities. Now they can effectively engage with the audience, setting new standards for the "artist-consumer" interaction. This contributes to the growth of authenticity and value of artworks, as each object becomes a unique and proprietary piece of art.

The positive impact of NFT technology manifests in expanding opportunities for artists and increasing sales volumes in the digital art market. NFT technology opens new avenues for creative expression and audience interaction, creating uniqueness and ownership of artworks. It is important to note that there has been a recent decline in activity. This decline may be a natural stage in the NFT market's development cycle. Changes in trends may stem from the dynamic nature and constant evolutionary character of the technology itself and its impact on consumers and creative professionals, requiring careful study and adaptation to new market realities. In other words, the decline in activity may be defined as a natural stage in the NFT market's development cycle [1].

However, along with these new opportunities come new challenges. For example, the development of the NFT market leads to increased competition, which may complicate the discovery and promotion of talented artists. Therefore, one of the main objectives of current research is to develop strategies to support and popularize creativity in the digital space.

Additionally, it is necessary to carefully examine the impact of NFT technology on the cultural landscape as a whole. Will it lead to global standardization of art, or, on the other hand, foster diversity and development of local and national artistic traditions? How does this technology influence the perception of art and its role in contemporary society?

It is evident that the development of NFT technology opens up broad opportunities for art, but it also presents new challenges. To fully realize the potential of this technology, more research is needed and strategies aimed at supporting and developing digital art in the conditions of the modern digital world must be developed.

The development of the digital market, largely driven by the growing popularity of digital art and NFT technology, not only leads to a change in the way art is evaluated but also radically reformats our perception of creativity and its consumption. However, what is even more unexpected and significant is the change in the role of art itself in our society. Renowned digital artist and designer Beeple has become the face of this transformation. The traditional art market, which valued works through galleries and auctions, dismissed digital art due to its infinite reproduction. This forced artists like Beeple to seek new opportunities in NFT markets. His works in this format rapidly appreciated in value, attracting the attention of the traditional art market. As a result, the first NFT in the world was sold at a Christie's auction for \$69 million (Fig. 1), which became a historic moment and set new standards in the field of art [2].



Figure 1. Beeple's EVERYDAYS: THE FIRST 5000 DAYS, which was sold for \$69,346,250

(<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=e62adaa6a067>)

Traditionally, art has represented higher cultural values, and its worth has been determined by elite circles, including auction houses and galleries. However, with the advent of new avenues for expression and branding of art through NFTs, this landscape has undergone dramatic changes.

New platforms have emerged, allowing artists not only to express themselves but also to reach their audience directly. This allows art to become more democratic and accessible, transitioning from elitism to universality. Consequently, instead of art being seen as an investment object or status symbol, it becomes a means of communication, uniting people regardless of their social status or financial situation.

Such a rethinking of art may have significant sociocultural implications, helping to change the way we perceive and interact with culture. Instead of a divide between elite and mass art, we may observe the rise of a new level of inclusivity and cultural diversity. Thus, the explosion of the digital market and the popularization of NFT technology could be a step towards a more democratic, equitable, and open cultural sphere.

Despite all the advantages brought by digital art and blockchain technology, it is necessary to acknowledge their potential drawbacks and issues that arise in their use. Security concerns and insufficient protection against fraud are some of the most important issues.

In-depth study of these aspects is important for developers of technology and artists to find optimal solutions to address them. For example, developing technical means to detect and prevent fraud, including improving algorithms for identification, authentication, and transaction monitoring. Collaboration with law enforcement agencies is also crucial. Additionally, creating effective legal protection mechanisms that safeguard the rights of art owners in the digital space is essential.

Furthermore, there is a need to actively work on developing and implementing ethical standards and recommendations for artists and NFT platforms to prevent copyright infringements and other legal issues. Such standards may include terms of use, dispute resolution mechanisms, and compensation mechanisms in case of rights violations.

Finally, it is important to enhance education among users and consumers of digital art regarding the risks and dangers associated with the use of blockchain technology and NFTs. The more people understand these risks, the more cautious and responsible they will be in using digital assets and participating in the NFT market [3].

One of the key questions regarding NFTs is the issue of copyright. While NFT technology provides the opportunity to own a unique instance of artwork, it also raises complexities regarding the determination of ownership and control over copyright. Current legal frameworks struggle to keep pace with technological advancements, leading to conflicts and misunderstandings among NFT owners, artists, and other stakeholders. Addressing these issues requires the development and refinement of legal mechanisms that ensure clarity and stability in relationships within the digital art realm [4].

Another important topic is the environmental issues associated with minting and crypto mining, which have become the subject of condemnation within the art and technology community. However, addressing these issues goes beyond simply implementing energy-efficient solutions in blockchain. A large amount of energy is consumed to ensure the security and stability of the network, which is a necessary component of any blockchain platform's functionality. Therefore, it is important to seek comprehensive solutions that consider not only environmental issues but also ensure the efficiency and security of the network.

Innovations in blockchain technologies, such as the proof-of-stake (PoS) algorithm and other energy-efficient approaches, are key elements in creating a more sustainable and environmentally friendly future for digital assets. However, research and development in this area should focus not only on improving energy efficiency but also on ensuring the security and stability of the network amid increasing popularity and transaction volumes.

Among the alternative algorithms that can help reduce energy consumption, the proof-of-authority (PoA) variant stands out. Unlike proof-of-work (PoW), where miners compete for the

right to create blocks by solving complex computational tasks, PoA involves the selection of designated network participants who have the right to generate blocks based on their authority. This solution can significantly reduce energy consumption as it does not require extensive computational power.

Another option is the use of the proof-of-space (PoSpace) algorithm. In this approach, miners prove their pre-existing knowledge (space) rather than by solving complex mathematical problems. This ensures network security without requiring significant computational effort. PoSpace can be an effective solution for reducing energy consumption as it relies on data storage rather than computation.

Both of these alternative approaches can be options for creating a more environmentally conscious blockchain network. Combining them or other energy-efficient solutions can help reduce the blockchain's environmental impact while ensuring network security and stability [5].

Thus, further research and development in the mentioned directions are critically important for creating an NFT ecosystem that is resilient, efficient, and environmentally safe.

Conclusions

The results of our research emphasize the significant impact of NFT technology on the digital art and design market. The implementation of NFTs opens up wide opportunities for artists and consumers, but it also brings certain risks, such as issues with legal control, copyright, fraud, and environmental concerns related to the high energy consumption of blockchains.

To ensure sustainable and environmentally friendly development of digital assets, our research advocates for active exploration and implementation of energy-efficient alternatives in blockchain. Among such alternatives, algorithms with a lower energy footprint should be considered, such as proof-of-stake (PoS), proof-of-authority (PoA), and proof-of-space (PoSpace).

Thus, there are prospects for the development of NFT technology as a means of stimulating creativity and fostering digital culture, provided that important issues arising during its implementation are addressed. This will require collaboration among all stakeholders, including artists, developers, legislators, and consumers, to ensure the effective and sustainable development of this promising segment of art and technology.

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